

Dental Digest

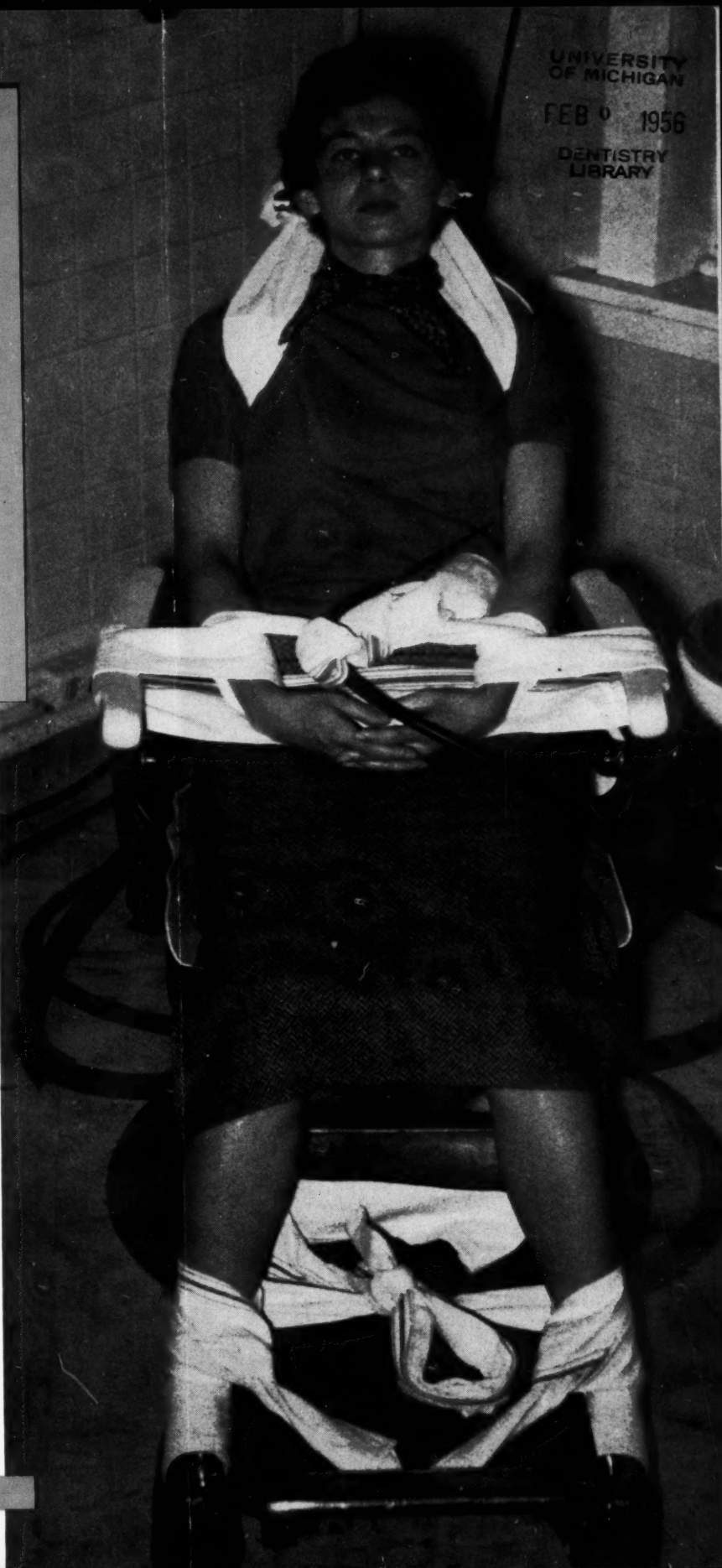
January 1956

IN THIS ISSUE

Efficient Restraints in Dental Anesthesia	10
Hydrocortisone Acetate Dental Ointment for Immediate Dentures	14
The Nature of Health	15
The Opening Axis of the Jaw... ..	16
Temporary Jaw Protrusion—Its Causes and Correction	20
Modification of the Acrylic Crown	26
A Newer Concept of Disease—Curative vs. Creative Medicine ..	28
The Relation of Adequate Nutrition to Atherosclerosis	28
Clinical and Laboratory Suggestions	30
Medicine and the Biologic Sciences	32

(A Complete Table of Contents appears on page 9)

Cover illustration—Vize article
page 10



.... DESCRIPTIVE

SYMBOLS THAT SIMPLIFY TOOTH SELECTION



This is how Five-Phase Anteriors simplify tooth selection and give your cases the "living" appearance you want.

M
MEDIUM LENGTH
42
WIDTH IN MILLI-
METERS OF 6 AN-
TERIORS CARDED
FLAT
C
DOMINANTLY "C"
CURVED LABIAL
CHARACTERISTICS

WIDTH OF 61 CARDED FLAT	36 MM	39 MM	40 MM	42 MM	43 MM	45 MM	46 MM	48 MM	51 MM
LONG	L36 C	L39 C F		L42 C F		L45 C F		L48 C F	L51 C
MEDIUM	M36 C	M39 C F	M40 C F	M42 C F	M43 C F	M45 C F	M46 C F	M48 C F	M51 C
SHORT		S39 C F	S40 C F	S42 C F	S43 C F	S45 C F	S46 C F	S48 C F	

To begin with, the actual length, width and labial character required for each case automatically forms the correct Five-Phase mold symbol to be specified. Thus, the symbol M42/C for example describes anteriors of medium length, measuring 42 mm carded flat, with dominantly curved labial character.

Next, selection is simplified further because of the orderly arrangement of sets in the coordinated size system diagrammed on the opposite page. Standard sets are available in a choice of dominantly Flat (F) or dominantly Curved (C) labial character... in a full range of widths from 36 mm to 51 mm (measurement of six anteriors carded flat)... in long, medium and short molds. Finally, the system is extremely flexible. The proximals of all Five-Phase Anteriors are co-acting! You can therefore choose from carded sets or when required, transpose centrals, laterals and cuspids from different sets to create personalized dentures. The Five-Phase Co-ordinate Size Mold System is designed to make this so easy for you to do.

FIVE FEATURES THAT ASSURE ACHIEVEMENT OF "LIVING" BEAUTY

1. You can select Five-Phase Anteriors with dominantly flat or dominantly curved labial characteristics.
2. You can transpose centrals, laterals and cuspids from different sets when required—a feature that is unique with Five-Phase Anteriors.
3. You can use more than one tooth color in the same denture.
4. You can achieve maximum flexibility in tooth selection and arrangement.
5. You can select Five-Phase Anteriors in your choice of either Veri-chrome Porcelain or Verident Plastic.

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Veri-chrome
COLORS OF
CONTROLLED
BRILLIANCE

FIVE-PHASE ANTERIORS
AVAILABLE IN VERI-CHROME PORCELAIN AND VERIDENT PLASTIC

Vol. 62, No. 1

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Dental Digest

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JANUARY 1956

About Our CONTRIBUTORS

JAMES LEROY VIZE, D.D.S. (St. Louis University Dental School, 1919) specializes in general anesthesia and oral surgery. Doctor Vize is a member of the Advisory Committee of the American Society for the Advancement of General Anesthesia in Dentistry. His current article is **EFFICIENT RESTRAINTS IN DENTAL ANESTHESIA**.

ROBERT H. AMESBURY, B. S. (University of Southern California, 1939), **D.D.S.** (University of Southern California, 1939) is a general practitioner. Doctor Amesbury engaged in research for Merck and Company for three years and is now living in a small town in California where, he writes us, he does all he can in the interest of dentistry. His first article to appear in **DIGEST** is **HYDROCORTISONE ACETATE DENTAL OINTMENT FOR IMMEDIATE DENTURES**.

LEONARD FRANK, a roentgenologist of note, has been a contributor to **DIGEST** since 1937 and has presented a number of highly informative articles concerning the physiology of the head and face. His article this month is an illustrated presentation, **THE OPENING AXIS OF THE JAW**.

HARRY L. PAGE, the author of a book, **MUCOSTATICS—A PRINCIPLE NOT A TECHNIQUE**, attended Hotchkiss and Yale. Mr. Page's particular interests are prosthodontia and articulation and he is the author of numerous articles on these subjects, many of which have appeared in **DIGEST**. Mr. Page's current article is **JAW PROTRUSION: ITS CAUSES AND CORRECTION**.

ALAN SIMONSON, A. B. (New York University, 1950), **D.D.S.** (New York University College of Dentistry, 1954) entered the Air Force after graduation. Doctor Simonson received the Sara Miller award for periodontia and in service his work is directed especially to periodontia. Doctor Simonson's first article in **DIGEST** is **MODIFICATION OF THE ACRYLIC CROWN**.

Efficient Restraints in Dental Anesthesia <i>James LeRoy Vize, D.D.S.</i>	10
Hydrocortisone Acetate Dental Ointment for Immediate Dentures <i>Robert H. Amesbury, B.S., D.D.S.</i>	14
The Nature of Health (An Abstract) <i>Tom D. Spies, M.D.</i>	15
The Opening Axis of the Jaw <i>Leonard Frank</i>	16
Temporary Jaw Protrusion—Its Causes and Correction <i>Harry L. Page</i>	20
Modification of the Acrylic Crown <i>Alan Simonson, A.B., D.D.S.</i>	26
A Newer Concept of Disease—Curative vs. Creative Medicine (An Abstract) <i>Jonathan Forman, B.A., M.D.</i>	28
The Relation of Adequate Nutrition to Atherosclerosis (An Abstract) <i>F. A. Kummerow, Ph.D.</i>	28
Clinical and Laboratory Suggestions	30
1. A Hinge to Articulate Study Models. 2. Impression for the Repair of a Broken Clasp. 3. Alginate Impression Solvent. 4. Reduction of Engine Belt Slippage. 5. Hole Punch for Rubber Dam. 6. Placing Calcium Hydroxide on a Pulp Exposure.	
Medicine and the Biologic Sciences	32
The Editor's Page	29
Contra-Angles	43

EDWARD J. RYAN, B.S., D.D.S., Editor**WANDA T. PICKARD, B.A., Assistant Editor**

708 Church Street, Evanston, Illinois

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Efficient RESTRAINTS

in Dental Anesthesia

JAMES LeROY VIZE, D.D.S., St. Louis, Missouri

DIGEST

A minor matter that is of major importance in general anesthesia in the dental office is the careful selection and judicious use of efficient restraining appliances which frequently make the difference between success and failure. Without minimizing the importance of premedication, the correct application and use of good restraints are valuable assets in controlling certain muscular reflexes of patients during the induction, maintenance, and recovery phases of anesthesia whether sedation is used or not. To the uninitiated, it would seem a simple problem indeed to restrain a patient in a dental chair but this is frequently difficult to do. This article describes a simple type of appliances which has been found effective and illustrates its application.

Restraint of Movement Necessary

Patients under anesthesia frequently have a tendency to slide, slip, squirm, and sag out of operating position if efficient restraining methods are not used. Most of the restraints recommended for this purpose have not been successful because patients work loose from them or because the appliance had to be applied too tightly to be effective. The leather strap with buckles and the fabric strap, also with buckles, often interfere with easy smooth respiration because they are applied across the chest. Patients can

slip wrists and hands from under them, they are difficult to keep clean, and from a hygienic standpoint they are objectionable.

Requirements—1. Good restraints should always be as immaculate as the towel, apron, or napkin used for the patient.

2. The appliance should immobilize the shoulders, arms, hands, and sometimes even the lower extremities in such a manner as to prevent the patient from slipping loose. The hands and arms in particular should be restrained.

3. The restraint should be laundered and sterilized for each patient.

4. Fabric and leather straps with buckles do not meet these requirements because bowknots and hitches are difficult to make in those materials. Pliability in the material is essential.

Simple Type Effective—After using various types of restraints the simplest type has been found to be the most effective and the easiest to use. These consist of nine or ten feet of extra strong roller towel material made up in a double width four inches wide. They must be made so that all seams will be on the inside after the bands are turned inside out. A supply of these appliances can be stocked to be used the same as other equipment that can be laundered and sterilized. This type of restraint is used in many hospitals by medical personnel where sterile restraints are required for cases to be anesthetized. For dental use the difference in the appliance is in the way it is made and applied.

Method of Application

1. The first restraint is applied across the back coming forward around and under the armpits of the patient. It is then brought up and over the shoulders with both ends brought back behind the patient where they are tied together with a simple bowknot to the headrest anterior to the top clutch of the headrest or to the clutch itself.

2. This restraint should be fairly taut to keep the patient from slumping and at the same time keep the patient in a semi-suspended position that will not allow him to slip down in the chair.

Releasing the Restraint—All the anesthetist has to do to release the patient is to pull out the bowknot.

Applied Routinely—Care should be taken to see that the headrest clutch is adjusted so the headrest will not slip from the weight of the patient. This restraint does not interfere with respiration and maintains the patient in proper operating position. It is routinely applied on all patients of all age groups before anesthesia is started (Figs. 1, 2, 5, 11, and 12).

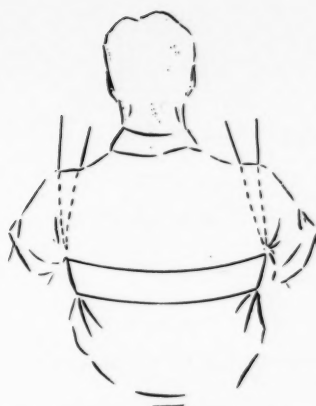
Application of Second Restraint

The second restraint can be brought up from the base of both sides of the chair or simply run through openings under the chair arms (some chairs do not have these openings) over and across the top of the midsection of the chair arms to the wrists of the patient where a half hitch is used around the wrists and a simple bowknot is made with the ends.

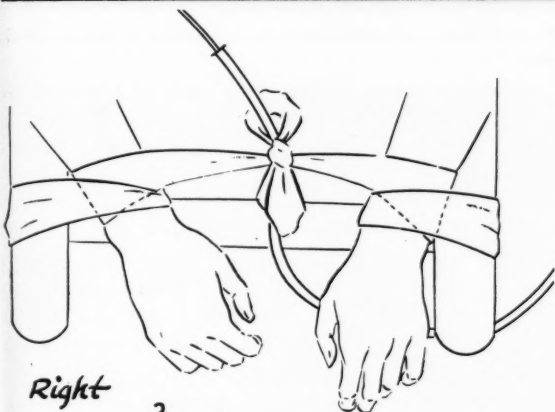
Method of Release—To release the patient from the restraint, pull out the bowknot.



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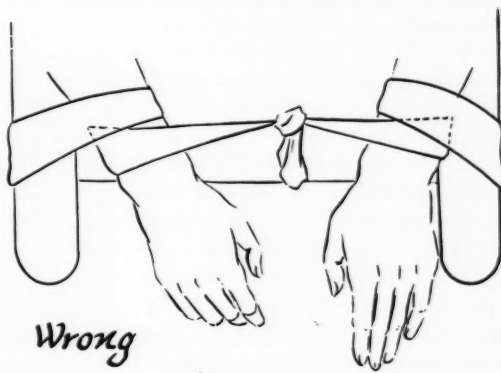


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Right

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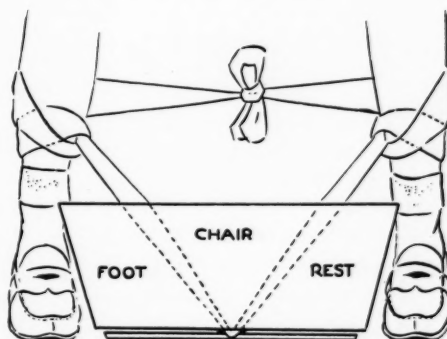


Wrong

4



5



6

1. Frontal view of shoulder restraint coming forward from under the arms, up and over the shoulders to be tied to headrest.

2. Shoulder restraint applied across the back going forward under the arms.

3. Hand and arm restraint in proper position. Note half hitches on each wrist with bowknot loop used as suc-

tion line holder. As the patient exerts pressure on this restraint the hitches become tighter around the wrists preventing withdrawal of hands.

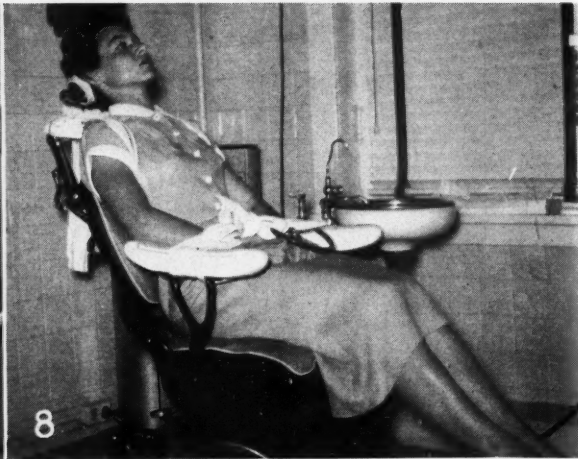
4. Improper application of hand, arm, and wrist restraint. Note reefes around wrists instead of hitches which permit hands and wrists to peel out of restraint.

5. Side view showing attachment of shoulder restraint to tight headrest with bowknot. Also note attachment of wrist restraint through opening under chair arm.

6. Ankle restraint snubbing lower extremities to sides, not top, of footrest. Modified hitch used.



7. Showing correct application of shoulder and wrist restraints.



8. Side view of shoulder and wrist restraints in proper position.

Suction Line Holder—This bow or loop makes a good suction line holder by running the line through the bow where it is always available to both the surgeon and the anesthetist.

Tightness Increased by Pressure—This restraint does not have to be drawn especially taut because the more pressure the patient puts on it, the tighter the top wrist hitches become. When this restraint is properly applied, it is almost impossible for the patient to work wrists and hands loose.

Prevents Slipping Forward—This appliance aids the first one in keeping the patient from slipping forward. During long operations when anesthesia is extended, care must be taken to see that these hitches do not interfere with circulation which will result in the hands becoming a reddish hue or cyanotic. In such instances (which rarely occur) the restraints can be readily loosened.

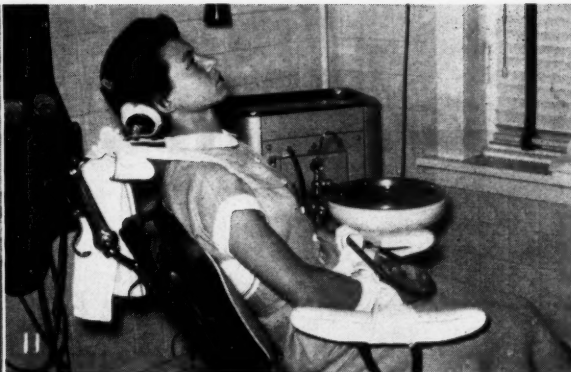
Half Hitch Necessary—The half hitch around each wrist must be used. This restraint is always available on the chair but is not applied until the patient becomes unconscious. In some instances, however, it may be applied at the start of induction. The novice in applying these restraints tends to use a reef around the wrists and invariably the patient slips out (Figs. 3, 4, 7, 8, and 10).



9. Patient in complete restraint with shoulder, wrist, and ankle restraints in position.



10. Rear view of wrist restraint attached to chair arm and shoulder restraint attached to headrest with bowknot that can be quickly released by pulling out the bow.



11. Showing bowknot tied across headrest bar that can be easily released by simply pulling out the bow.



12. Close-up of shoulder and wrist restraints with aspirator in loop.

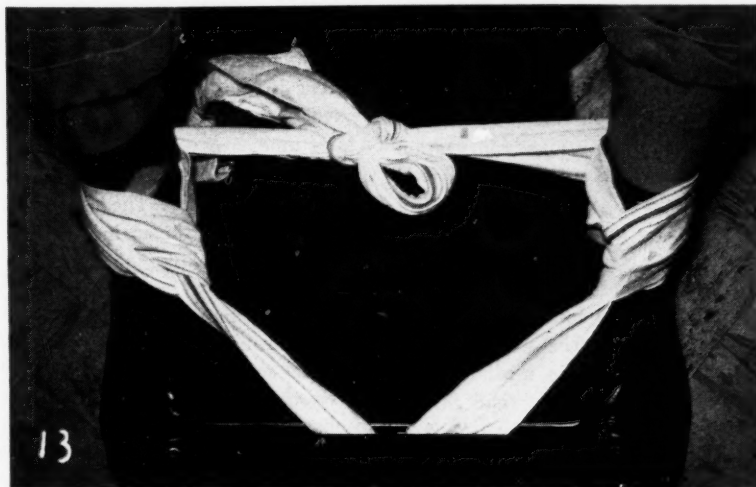
the footrest of the chair snubbing the feet and ankles to the sides, not the top, of the footrest.

2. With all three of these restraints properly applied, most active patients can be controlled, leaving the anesthetist and oral surgeon free to concentrate on the anesthesia and surgery with no interference from the patient and no undue exertion on their part.

Ankle Restraint May be Important

—The third restraint is rarely necessary but when ankle restraints are needed they are vitally important. To restrain the body, hands and arms, leaving the ankles free leads to difficulty in certain cases. For this reason chairs without footrests have been found to be more of a liability than an asset (Figs. 6, 9, and 13).

3608 South Grand Avenue



13. Position of ankle restraint as attached to chair footrest also bow tie for quick release.

Third Restraint May be Used

The two restraints described are usually all that are necessary with the majority of patients. With muscular adult patients, however, capable of exerting considerable force, a third restraint may be used.

Method of Application—1. This restraint is applied to the middle bar of

HYDROCORTISONE ACETATE *Dental Ointment*

for Immediate Dentures

ROBERT H. AMESBURY, B.S., D.D.S., Susanville, California

DIGEST

The report in this article is concerned with the use of hydrocortisone acetate dental ointment 2.5 per cent under immediate dentures for the suppression of the inflammatory process resulting from the trauma associated with multiple extractions and alveolectomy.

Early Methods of Application

The adrenocortical hormones, cortisone and hydrocortisone, have been used with dramatic results in a variety of inflammatory and collagen diseases.¹ The early investigations were limited to intramuscular injection of the hormone. This mode of therapy was followed by oral administration of tablets containing the hormonal agent. Later, topical application of a dermatologic ointment of hydrocortisone acetate resulted in prompt relief of symptoms in the treatment of various dermatologic conditions.²

Medical Uses—The successful use of these hormones in medical practice encouraged Streat,³ and Streat and Horton⁴ to apply these materials in the treatment of a variety of diseases of the oral cavity.

Diseases of the Oral Cavity—The results of the investigations of Streat and Horton stimulated others to try

the hormone in such conditions as cheilosis and aphthous stomatitis,⁴ apical periodontitis,⁵ and various recalcitrant diseases of the oral cavity.⁶ The following is a statement of the results obtained in the use of hydrocortisone acetate dental ointment 2.5 per cent under immediate dentures for the suppression of the inflammatory process resulting from the trauma associated with multiple extractions and alveolectomy.

Clinical Factors Involved

A total of 430 immediate dentures, maxillary and mandibular, were inserted. The age distribution in the cases ranged from 20 years to 72. The number of teeth extracted at one time varied from four to 14, with an average of nine.

Anesthetic Used—Local or general anesthetics were used. The local anesthetics included Ravocaine®, Unocaine®, and Xylocaine®. The general anesthetics were Vinethene®; Vinethene® induction and ether; Vinethene®, nitrous oxide and oxygen; and pentothal sodium.

Periods of Observation—Periods of observation lasted from the time of surgery until the closure of the wound. This period varies from four to ten days. After extraction of the teeth, alveolectomy was performed where necessary.

Denture Material—All dentures were made of acrylic.

Applications Twice Daily—Hydrocortisone acetate dental ointment 2.5 was applied twice per day, morning and afternoon, after cleaning the denture with a brush.

Control Cases—The number of control cases, not using the ointment, was limited to 15.

Results Obtained

Regardless of the number of teeth extracted and the necessity of alveolectomy, application of hydrocortisone acetate dental ointment 2.5 per cent under the denture had the following effects:

(1) Dramatic relief from pain which was more rapid after general anesthesia than after local anesthesia, regardless of the anesthetic agent used

(2) Suppression of the inflammatory process

(3) Prompt healing of the traumatized tissue

(4) Almost total absence of offensive odors

Conditions in Control Cases—The control cases where hydrocortisone was not used were (1) characterized by pain under the denture, (2) the gingivae were inflamed for many days, and (3) the foul odor under the denture persisted despite the use of mouth washes.

Tests for odor were made by the patient, the nurses, and the author. All were agreed when odors were present or absent.

Results Unaffected by Infection—The beneficial results obtained in the use of hydrocortisone acetate dental ointment 2.5 per cent were not affected by the presence or absence of infection in or around the teeth prior to extraction.

¹Hench, P. S.; Kendall, E. C.; Slocumb, C. H.; and Polley, H. F.: Effect of a Hormone of the Adrenal Cortex (17-Hydroxy-11-dehydrocorticosterone: Compound E) and of Pituitary Adrenocorticotrophic Hormone on Arthritis; Preliminary Report, Proc. Staff Meet., Mayo Clinic 24:181-197 (April 13) 1949.

²Sulzberger, M. B.; Witten, V. H.; and Smith, C. C.: Hydrocortisone (compound F) Acetate Ointment in Dermatologic Therapy, JAMA 151: 468-472 (March) 1953.

³Streat, L. P.: Possible Role of Cortisone in Dental Practice, New York J. Dent. 22:102-104 (Feb.) 1952.

⁴Streat, L. P., and Horton, C. P.: Hydrocortisone in Dental Practice, DENTAL DIGEST 59:8-16 (Jan.) 1953.

⁵Wolfsohn, B. L.: The role of Cortisone in the Control of Apical Periodontitis, Oral Surg. Oral Med. & Oral Path. 7:314-321 (April) 1954.

⁶Robinson, H. B. G.: Recalcitrant Diseases of the Oral Cavity, Proc. Inst. Med. Chicago 20: 125-126 (Jan.) 1954.

Discussion

Application of hydrocortisone acetate dental ointment 2.5 per cent under immediate dentures seems to suppress the inflammatory process resulting from the trauma of multiple extractions and alveolectomy. Apparently the hormone must be absorbed locally. It is believed that the hormone produces a decrease in the increased capillary permeability, thereby reducing the amount of edema fluid. The edema fluid already present is probably drained by the lymphatics rather than reabsorbed by the blood vessels.

No Delay in Wound Healing—Since the hormone was used in low dosage, no delay in wound healing was observed, supporting the view that the catabolic effect of hydrocortisone is evident only in the presence of high and prolonged dosage. For the same reason, no exacerbation of infection was noted. In fact, there is some laboratory evidence to support the view that small doses of hydrocortisone may enhance immunity to pneumococcus infection.

Absence of Odors Noted—The almost total absence of offensive odors under immediate dentures after the

use of hydrocortisone acetate dental ointment 2.5 per cent may be explained by the reduction of exudate resulting from the suppression of the inflammatory process. It is believed that decomposition of the exudate by oral bacteria results in protein metabolites possessing foul odors.

Determining Factor in Recovery—Although the number of control cases were relatively few, in a personal practice it was deemed inadvisable to deprive a large number of patients requiring immediate dentures of the use of the ointment after observing its beneficial effects, and the discomfort in the control patients. It is unusual for 430 successive patients requiring immediate dentures to experience uniformly uneventful recoveries. It is reasonable to conclude, therefore, that the determining factor was the application of the hydrocortisone acetate ointment.

Encouraging Results with Use of Adhesive Powder—An attempt is being made to reproduce these results in a similar group of patients using hydrocortisone denture adhesive powder 0.5 per cent. The results, thus far, are highly encouraging with the use of this material.

Summary and Conclusions

Hydrocortisone acetate dental ointment 2.5 per cent was applied in 430 cases of immediate dentures with uniformly uneventful recoveries. There were (1) marked suppression of inflammation, (2) decrease in postoperative pain, (3) almost total absence of offensive odors under the denture, and (4) rapid wound healing. The control patients, numbering 15, complained of discomfort and the presence of foul odors under the denture. The application of hydrocortisone acetate dental ointment 2.5 per cent under immediate dentures represents a new use for this product and it is recommended for the control of the inflammation which results from the trauma of multiple extractions and alveolectomy.

604 Cottage Street

Author's Note: Appreciation is expressed to Lyon P. Strean, Ph.D., D.D.S., Medical Division, Merck & Co., Inc., Rahway, N.J., for assistance in the clinical trial reported here. The ointment used in this study was Hydrocortone Acetate Dental Ointment 2.5 per cent, the Merck brand of hydrocortisone acetate.

The Nature of Health

TOM D. SPIES, M.D., Chicago

IN THE present-day practice of medicine we often apply therapy the nature of which little is known. Our working concept is that health is the accurate, harmonious and constant integration of all the necessary biochemical factors in the body. The amino acid balance, the vitamin balance, the endocrine balance, the electrolyte balance, the control of body temperature, the maintenance of blood glucose level, and the supply of oxygen to the cells are a few of the important factors.

Ill Health from Biochemical Imbalance

Ill health may result from a de-

range of any biochemical system which disturbs the harmony of the cells. Prolonged ill health may result from sudden trauma, acute infections, or even from disturbance of mental processes. Associated with the emotions are many biochemical phenomena. Fear may produce syncope; sadness may produce excessive lacrimation; are many biochemical phenomena. Sensitivity to pain. The state of mind, therefore, can alter body functions. Body and mind must work together continuously and are mutually dependent. The normal outcome of a harmonious relationship is health.

On the early perception of any

source of disharmony depends the success of preventive medicine. By the time the characteristic physical signs of a disease are observed, the tissues already have been badly damaged. Accordingly, the physician should attempt to develop insight into the biochemical action within the cell in order to have knowledge of living processes. The mechanism of action may be unknown, but he should not fall into the error of thinking it is unknowable. It is a formidable undertaking to initiate this concept but it must be undertaken.

Adapted from *Postgraduate Medicine* 17:6 (March) 1955.

The OPENING AXIS

of the JAW

LEONARD FRANK, San Francisco

DIGEST

Contemporary literature is replete with articles on the hinge axis of the condyle in relation to the condylar path but little reference is made to the importance of the opening axis of the mandible in the region of the mandibular foramen in relation to the opening of the mouth. This article presents evidence, radiographically and anatomically, showing the opening axis of the mandible to be in the region of the mandibular foramen.

Temporomandibular Articulation

It is quite possible of course for the mouth to open on a pure hinge movement of the condyle without the usual gliding, down and forward movement but this is usually a movement of convenience or it is a learned movement.

Complementary Movements—The hinge axis of the condyle and the opening axis of the mandible are two different movements having different purposes but operating simultaneously, one movement complementing the other. The temporomandibular articulation is the only bilateral joint in the human skeleton. One joint cannot move without the opposing joint going into function.

Two Joints Involved—The temporomandibular articulation is actually composed of two joints, an upper and a lower joint separated by the meniscus.

The Hinge Movement—In the lower joint the condyle articulates with the meniscus. This is the hinge movement

and it is the only movement that this joint can make.

The Gliding Movement—In the upper joint the meniscus articulates with the glenoid fossa. This is the gliding movement that carries the condyle to all of its eccentric positions. It is the only movement that this joint can make.

Hinge Movement Supplemented—The jaw opening on a hinge axis is a rotary movement of the lower joint of the articulation but the opening axis of the mandible needs something more than a hinge so nature has supplied the gliding movement in the upper joint so that the condyle can move down and forward as the jaw drops into open position while the angle of the jaw moves backward and slightly upward.

Variation in Asymmetrical Condyles—Schier¹ comments that "the condyles and fossae are irregular and irregularly related to each other. Both condyles are fixed to one mandible. (This extremely important point is usually given little consideration.) The transverse axis of each condyle is different from the other. The initial movement is hinge in character but the movement is not a true hinge with-in its own center pin (the transverse axis of each condyle head) but the hinge axis around a mean axis of the two heads. Hence, even if both condyles were symmetrical in form, the very nature of their axis and rotation would hardly indicate a true circular movement. We may compare this by placing two very loose hinges on a

door, but not in the same vertical line. You may open the door but it will not open straight." In this connection it is well to remember that the condyle is always above or below, behind or in front of its opposing condyle. There will be as many asymmetrical condyles as there are human beings.

Difficulties in Locating Hinge Axis—The investigations of Higley,² by means of the x-ray, seem to prove that a definite hinge axis cannot be located. Kurth and Feinstein³ observed that "it is most unlikely with all the variables operating in the case of the determination of the hinge point-perception, anatomy, physiology, the ability of the patient to follow instructions, the preconceived prejudices of the operator, that the hinge axis can be located with any degree of accuracy."

Opening Axis of Jaw Accurately Located—On the contrary, the opening axis of the jaw, in the region of the mandibular foramen, can be located with a great degree of accuracy.

Jaw Does not Open by Gravity Alone

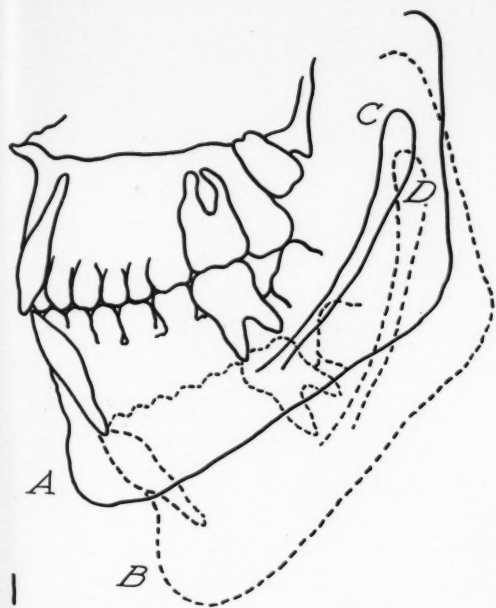
Lord⁴, working with Prentiss, made the following statement: "In observing the opening of the jaws in the living it is apparent that the mouth opens ordinarily by a positive direct action, not passively, by its own weight." Lord, no doubt, refers in this statement to gravity. The theory that the mouth opens by gravity alone is not tenable as we can eat lying down or on our side. In an act which appeared many years ago on the Or-

²Higley, L. B., and Logan, R. A.: Roentgenographic Interpretations of Certain Condyle and Menton Movements, JADA 28:779-785 (May) 1941.

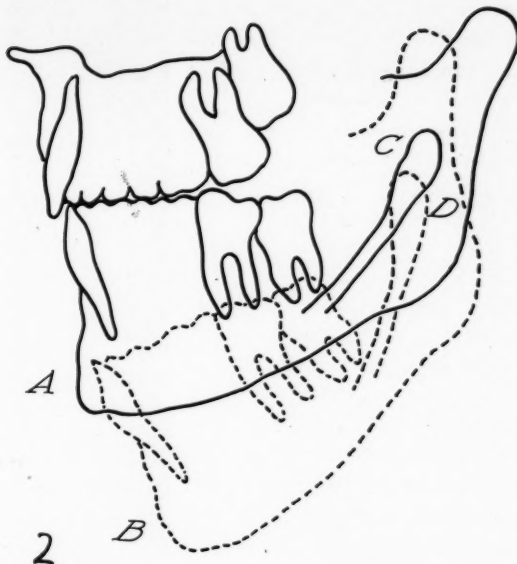
³Kurth, L. E., and Feinstein, I.K.: The Hinge Axis of the Mandible, J. Pros. D. 1:327-332 (May) 1951.

⁴Lord, F. P.: Observations of the Temporomandibular Articulation, Anat. Rec. 7:355-357 1915.

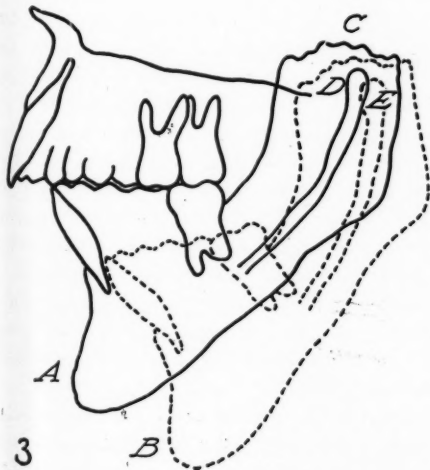
¹Schier, Mayer: The Temporomandibular Joint. A Consideration of its Functional and Disfunctional Sequelae, D. Items of Interest 70:1095-1109 (Nov.) 1948.



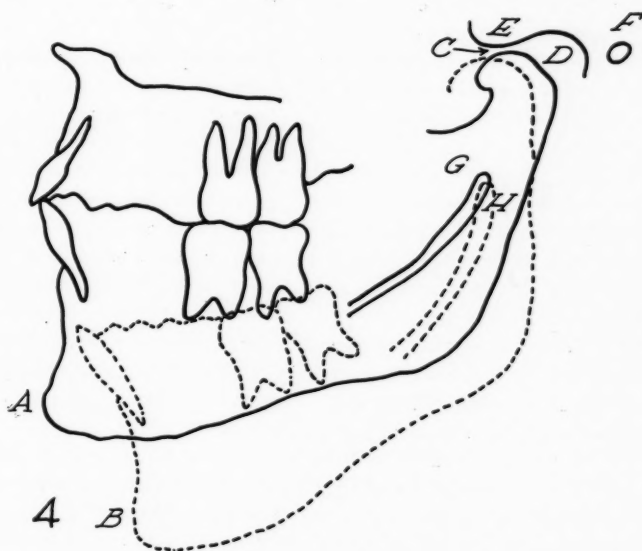
1. Orthodox method. This is the usual method of taking an x-ray of a lateral jaw. The head is positioned on a 5 x 7 film tunnel in order to facilitate the changing of films without changing the position of the head. (A) Jaw in closed position. (B) Jaw in open position. (C) Inferior dental canal and mandibular foramen with jaw in closed position. (D) Inferior dental canal and mandibular foramen with the jaw in open position.



2. Cephalometric x-rays of the normal jaw. (A) Jaw in closed position. (B) Jaw in open position. (C) Inferior dental canal and mandibular foramen with jaw in closed position. (D) Inferior dental canal and mandibular foramen with jaw in open position.



3. Cephalometric x-rays of a bilateral condylectomy. (A) position. (B) Jaw in open position. (C) Line showing the superior border of the rami after removal of the condyles. (D) Inferior dental canal and mandibular foramen with jaw in closed position. (E) Inferior dental canal and mandibular foramen with jaw in open position.



4. Cephalometric x-ray of a united bilateral condylar fracture. (A) Jaw in closed position. (B) Jaw in open position. (C) Space for the meniscus. (D) Glenoid fossa. (E) Eminentia (articular tubercle). (F) External auditory meatus. (G) Inferior dental canal and mandibular foramen with the jaw in closed position. (H) Inferior dental canal and mandibular foramen with the jaw in open position.

pneum circuit in San Francisco one performer balanced himself on his head on the head of another performer and while in this position, standing on his head, ate a plate of food.

Corroborative Opinions—Lord believed, with many others, that the center of the axis of the opening movement of the mouth was in the vicinity of the mandibular foramen. This being the position of minimum strain and of relative rest, it would be expected that the nerves and blood vessels would enter the bone (mandible) in this area. Lord also states that "the stylomandibular and the sphenomandibular ligaments restrain the mandible (in opening) particularly in the region of the mandibular foramen from moving forward and, therefore, make this region the axis of rotation."

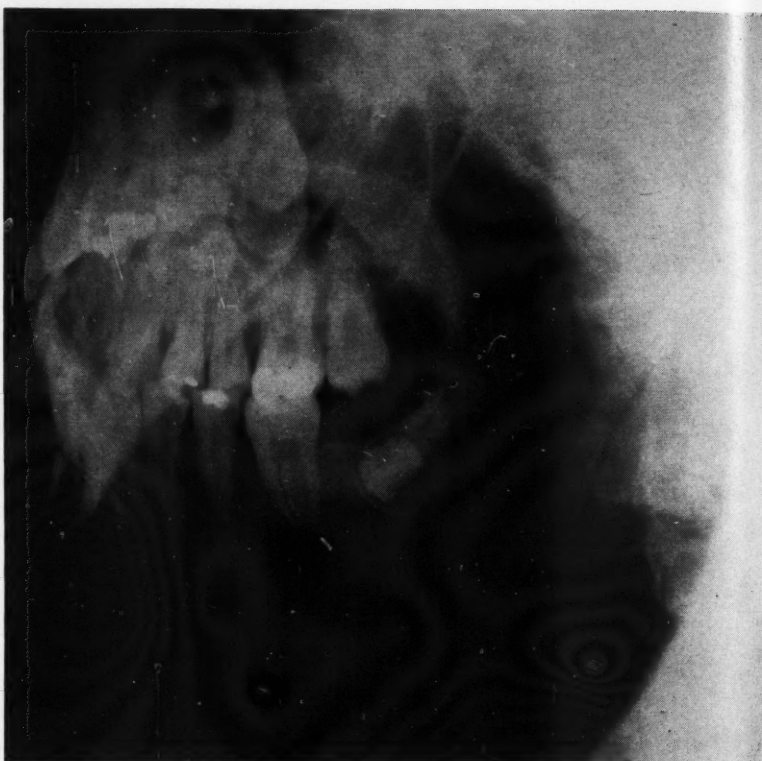
Statement Confirmed — Sicher⁵ confirms Lord's investigations: "The place of entry for the nerves and blood vessels must be at a point which is relatively stable and where the excursions of the mandible are the smallest. This point is, in the human mandible, the place where the mandibular foramen and the sulcus mylohyoideus begin. In the complicated mechanisms of the human articulation there is one optional point, and this point must be the common place of entrance for both nerves and blood vessels."

Additional Evidence — Hemley⁶ comments that "In consequence of the movements of these soft tissues the inferior dental foramen is somewhat funnel shaped. It is this wider orifice of the foramen which delineates the extent of the anterior-posterior movements of the rami at this point and the funnel-shaped opening indicates the region in which the soft tissues prevent the bone formation as the artery, vein and nerve enter the canal. The area encompassed by this orifice is the area which marks the center of rotation of the condyle."

⁵Sicher, Harry: Development of the Temporomandibular Articulation in Man, *Ztschr. F. Stomatol.* 32:269, 1937.

⁶Hemley, S.: Fundamentals of Occlusion, Philadelphia, W. B. Saunders Company, 1944, pp. 143-144.

⁷Walsh, J. P.: The Temporomandibular Joint with Reference to Costen's Syndrome, *New Zealand D. J.* 44:240-253 (Oct.) 1948.



5. An example of an x-ray taken with the orthodox or lateral jaw technique.

Investigation of Opening Axis of Jaw in Living Human Beings

In all the literature examined no visual evidence has been found depicting the opening axis of the jaw other than hand-drawn sketches. For this reason it was determined to make an investigation of the opening axis of the jaw in the living human being. Two methods of approach were used: (1) the orthodox or lateral jaw technique, and (2) the cephalometric technique.

Opposed Points of Vantage—These two methods depicted the same thing from two opposed points of vantage:

1. The orthodox or lateral jaw technique. A film tunnel was used to facilitate the changing of films without moving the patient's head. Two x-rays were taken, one in the closed position and one in the open position. Tracings were made from these films. The tracing of the film taken in closed position

was superimposed on the tracing of the jaw taken in open position (Fig. 1).

2. The cephalometric technique. Cephalometric x-rays were taken with the jaw in open and closed position. Tracings were made of each position and superimposed one on the other (Figs. 2, 3, and 4). Figure 5 is an example of an x-ray taken in the orthodox or lateral jaw technique. Figure 6 is an example of an x-ray taken with the cephalometric technique.

Constant Characteristics Revealed—In the tracing of all paired films two characteristics were predominately constant:

1. The images of the mandibular foramen in the closed and open positions remained in close proximity to each other, giving evidence that this is the neutral point of the mandible. This neutral point is the opening axis and the region where the nerves, veins and arteries enter the jaw with the least danger of rupture.

2. In open position the image of



6. An example of an x-ray taken with the cephalometric technique.

the mandibular foramen is slightly below the image of the mandibular foramen in closed position. This difference of position is a reflection of the gliding movement of the condyle in its translation from closed to open position.

Roentgenographic Views Compared

Figures 1 and 2 are paired x-rays of normal jaws. Figure 3 shows paired x-rays of the results of a bilateral condylectomy and Figure 4 shows paired x-rays of a bilateral condylar fracture. Walsh⁷ stated, "It is possible to masticate without condyles." Later Boswell⁸ stated, "But even the condyles

may not be necessary for masticating function."

Opening Axis at Same Point in Normal Jaws—In consideration of these two opinions Figure 3 becomes increasingly interesting. The most illuminating fact is that the opening axis is shown at the same point as that shown in the normal jaws having condyles. It should be borne in mind that the jaws shown in Figures 1, 3, and 4 have their external pterygoid muscles still attached to them while the jaws shown in Figure 3 have had their external pterygoid muscles severed.

Jaw Opens Without External Ptery-

⁸Boswell, Jesse V.: Practical Occlusion in Relation to Complete Dentures, J. Pros. D. 1:307-321 (May) 1951.

goid Muscles—Returning to the discussion of the opening movement of the jaw being one of "force" or "gravity," Figure 3 can be used for analysis. In the opinion of many investigators the external pterygoid muscle is the "opener" of the jaw, yet here is a jaw that opens without external pterygoid muscles. Examining the position of the jaws without condyles, in relation to the skull as a whole, it is found that the jaws are approximately in their correct position in relation to the skull as a whole.

No Change in Position of Opening Axis—Of prime importance is the fact that there is no change in the position of the opening axis (Fig. 3). This would tend to show that the removal of the external pterygoid muscles has not caused an imbalance of the elevator or depressor muscles.

Different Approach—In Figure 4 is shown paired cephalometric x-ray views of a united bilateral condylar fracture. This series afford insight into nature's methods of managing articular injuries. The original x-rays of the injuries in this case, taken in 1949, showed both condyles fractured at their necks and depressed downward and forward. The x-rays also showed that neither condyle was in its respective fossa. The present x-rays, taken in 1955 (Fig. 4), reveal both condyles articulating on false joints at the eminentia with space being provided to accommodate the meniscus. Even with changes in position the opening axis of the jaw is shown to be in approximately the same position as the opening axis of the normal jaw. Again there seems to be no imbalance of the elevator or depressor muscles.

Conclusion

The hinge axis of the condyle and the opening axis of the jaw have been discussed and tracings from the original x-rays have been shown, demonstrating that the opening axis of the jaw is in the region of the mandibular foramen.

450 Sutter Street

Temporary JAW PROTRUSION

Its Causes and Correction

HARRY L. PAGE, Valparaiso, Indiana

DIGEST

In studying the articulation problem it has been observed that jaws habitually functioning in protrusion may have become fixed in that position temporarily. With proper treatment they will start returning to normal position, rapidly at first, gradually later. This article discusses the temporary protrusion problem, its causes, and the remedy.

Protrusive Function in Articulation

All articulation methods that rely upon centric relation force the patient to function in protrusion. Mathematical proof of this has been demonstrated in a previous article.¹ To visualize the reason, note the schematic Figures 1, 2, 3, and 4 presented here.

Figure 1. Occlusion rims in the head are shown contacting in "centric occlusion" with the condyles in correct "centric relation."

Figure 2. The luted rims are shown mounted in an articulator still in undisturbed centric occlusion and relation.

Figure 3. This represents the teeth after setup to this centric occlusion and relation in an articulator; any articulator.

Figure 4. The teeth are shown returned to the mouth.

Articulation is Motion—Centric relation has no control over motion (kinematics). Centric relation plays no part in any setup or occlusal adjustment either in the head or in the

articulator. Opening and closing motions during setup will be controlled by the articulator hinges (Fig. 3) while motions during function will be controlled by the condylar hinge-axes (Fig. 4). The respective control centers being located differently, there will be no congruence between the closure arcs in the articulator and the head. As a result, the jaw must shift bodily forward if the teeth are to interdentate. Daily experience in almost any dental office substantiates this observation.

Cuspless Teeth Show Centric Relation Fallacy—Further confirmation may be obtained by study of the types of teeth recommended by the majority of teachers and clinicians. No matter what these teeth are called, almost all of them are some form of cuspless tooth. Cuspal interference and stresses supposedly created by cusps are leading topics of clinical discussion and it is rare when the remedy recommended is anything but some type of unnatural flat or semiflat tooth. Rapp², after surveying the published opinions of internationally known prosthodontists, concludes: "The real choice, however, is not so much which of the two types [anatomic or non-anatomic] is more effective but which of the nonanatomic teeth is more suitable." This article won the 1953 American Denture Society prize. It may therefore be assumed that his conclusion represents the prevailing opinion.

Chewing Motions the Crux of Dentistry—It is not difficult to understand this preference for what McCollum³

called "monstrous tooth forms." McCollum⁴ gave as the reason: "... men in despair have tried to dodge the crux of dentistry, the chewing motions of the jaw, by making either cuspless teeth or what amounts to the same thing, making cusp perversions."

Articulation Oversimplified—Cuspless teeth make it unnecessary to learn how to articulate teeth correctly in conformity with natural jaw function for they can be brought together casually in almost any position without painful interferences; they have no complicated surfaces, no cusps that must pass each other without colliding en route to interdentation.

Erroneous Expedient—Acceptance and endorsement of aborted tooth surfaces is not the true answer to the problem of articulation; it is merely a resort to a second error in an effort to relieve the result of the first error which is centric relation. This statement is made with full knowledge of the usual arguments that favor cuspless teeth. Study and analysis will show these arguments and the illustrations used to support them to be more ingenious than ingenuous. Furthermore, they tend to prove a subjective rather than an objective point.

Comparison of Masticating Habits

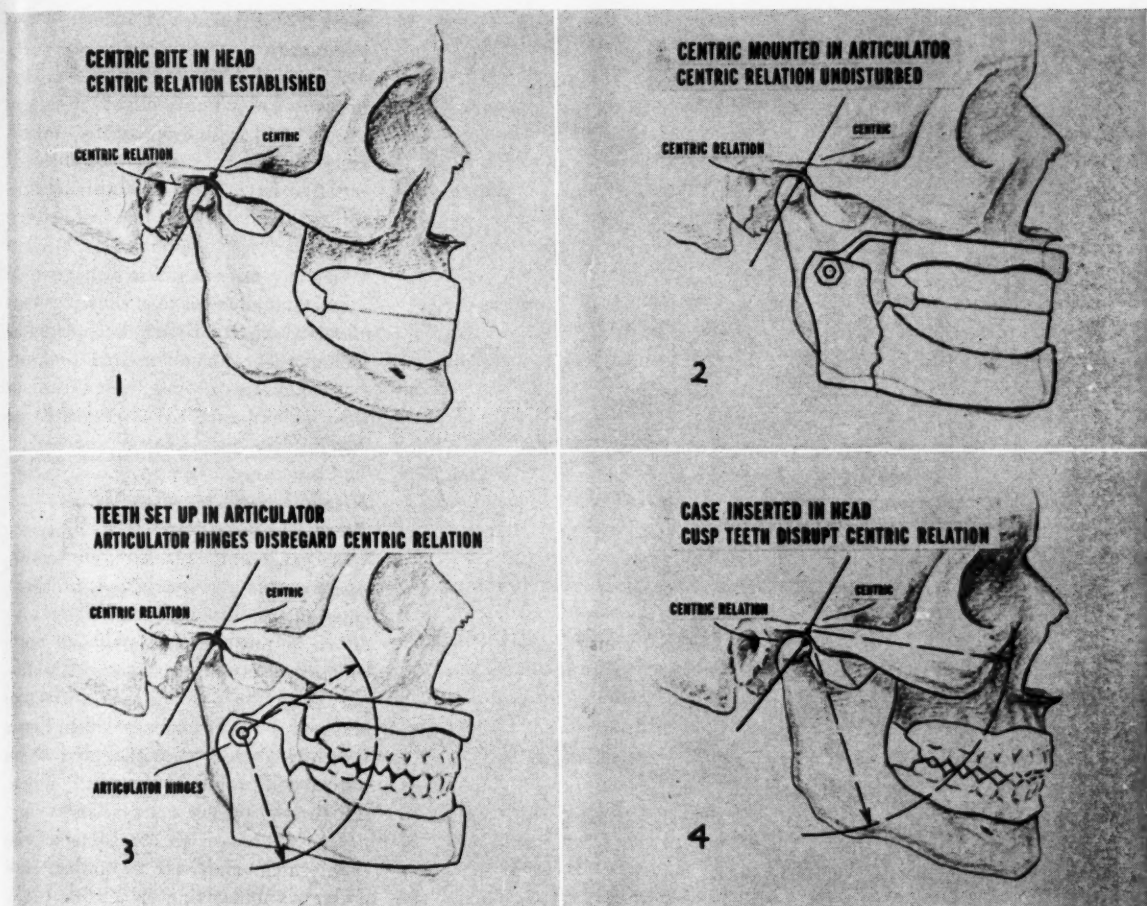
Periodically the mandible bone and teeth of an Eskimo or some aborigine demonstrating flat badly worn working surfaces that cant to the buccal are produced and extolled as the ideal in occlusion and articulation. The difference between uncivilized masticating habits and those of civilized man is completely ignored.

¹Page, Harry L.: Lexicography, Hinge Opening, Hinge Closing and Centric, DENTAL DIGEST, 61:17-23 (Jan.) 1955.

²Rapp, Robert: The Occlusion and Occlusal Patterns of Artificial Posterior Teeth, J. Pros. Dent. 4:479 (July) 1954.

³McCollum, Beverly B.: Fundamentals Involved in Prescribing Restorative Dental Remedies, Dental Items Interest, Reprint from June 1939 to Feb. 1940, p 52.

⁴Ibid.



1. Centric bite in head. Centric relation established.

2. Centric mounted in articulator. Centric relation undisturbed.

3. Teeth set up in articulator. Articular hinges disregard centric relation.

4. Case inserted in head. Cusp teeth disrupt centric relation.

Difference in Habits—Primitive people prepare skins for clothing by grinding laterally, thereby softening dirt-encrusted hides with their teeth. They munch grit-impregnated foods with indifference. Civilized masticatory and dietary habits are hardly comparable. If the uncivilized man's type of abraded tooth is to be the civilized ideal, then it should be advertised that an automobile with 200,000 miles on the odometer is superior to one just off the production line. The well-worn automobile may still run and the worn tooth may still function but that is no reason to distinguish either as an example of perfection.

Popular Theories—It is contended that the alveolar bone surrounding the roots of the Eskimo's teeth is in

excellent condition. This would seem to assure the proponent of flat teeth that progressive occlusal abrasion in the elderly mouth is a natural protection against stress and trauma. This agrees with another popular theory; namely, that occlusal surfaces should conform to age, young teeth for the young and old teeth for the old.

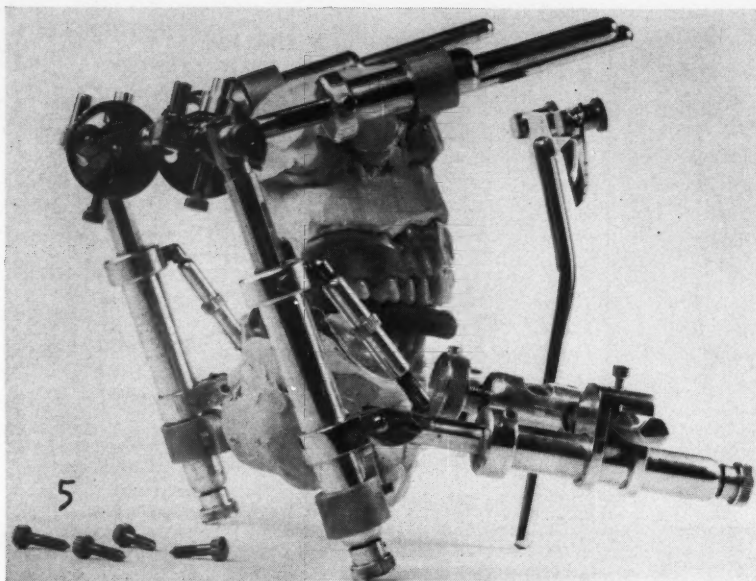
Anomalies Cited as Standards

(1) Cases are reported where mouths have been "saved" by arbitrary removal of the lower buccal and the upper palatal cusps. (2) Dentures made with plane occlusion and flat posteriors pitched to an "anti-Monson curve" are commended for showing wear similar to "their original pattern," the inference being that wear consistent with a prototype form con-

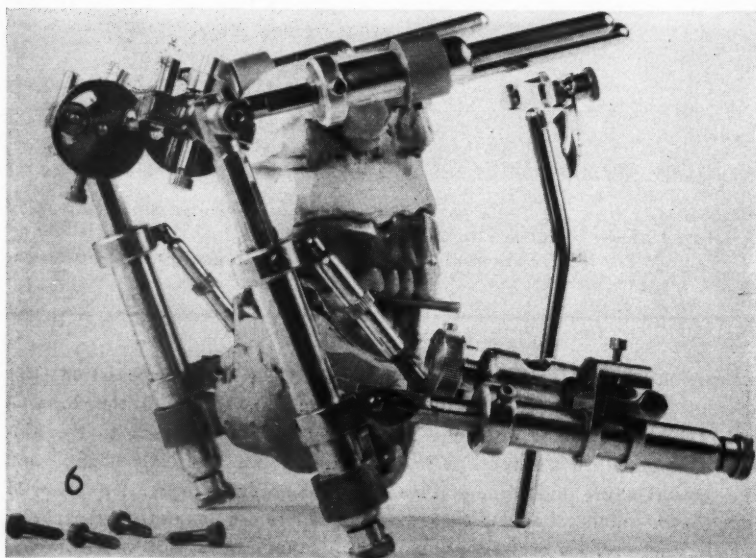
notes excellence in articulation. (3) Reference is made to the tobacco chewer with teeth worn to the gingival line but "perfectly sound" and bonded in sturdy bone. No one with any experience denies the existence of such examples but are these anomalies to be the criteria for *correct articulation*?

Conventional Precepts Challenged

—In my youth among the Litchfield Hills of Connecticut there were many inveterate tobacco chewers among elderly acquaintances. They had "chawed" since they were big enough to filch a "Battle-Ax" plug from their fathers' pockets. Not one of them had enough snags left to punch a ticket and the memory of their sunken mouths pumping like the village



5. One of several original bites of varying thicknesses being accepted perfectly by the Transograph.



6. The Transograph is shown accepting a bite with about 3 millimeters of occlusal separation. Note that in both Figure 5 and Figure 6 the four end-tapered screws have been removed completely from the bosses which top the condyle sliders.

blacksmith's bellows is still fresh. As for the artificial teeth defaced to follow a "known pattern of wear" set to plane occlusion and an "anti-Monson curve" and the natural teeth that were

"saved" by destroying their cuspal surfaces, was any attempt made to learn how to articulate the natural cusps in accordance with functional jaw movements before mutilating

them? Without doubt, the answer is negative.

Standard Articulation Methods Disappointing—When judged by any group of objective operators, the results of these and other conventional precepts have been and still are unsatisfactory. During the last fifteen years serious clinicians, dissatisfied with conventional failures, have won important citations for showing that standard articulation beliefs are fallacious. They have insisted that articulation must give up these mistaken theories and turn to "functional" or "cyclic" jaw movements.

Functional or Cyclic Jaw Movements

As yet, neither teachers, clinicians, nor even the cyclic articulation advocates themselves have made any real effort to put the new precepts into practice. Not until real interest is displayed in the observations and conclusions of others experienced in these new articulation principles and techniques will progress be made. "When the time spent by dentists in trying not to get down to 'brass tacks' is spent in an endeavor to understand and apply underlying principles . . ."⁵ there will be worthwhile general advance in articulation methods.

Illustrations Misleading—A study of the drawings purporting to show that cusp teeth produce detrimental lateral forces during mastication reveals that the flat tooth advocate invariably represents the forces as though a cusp tooth had only one or, at most, two chewing surfaces. For instance, drawings designed to picture the stresses produced antero-posteriorly during jaw closure have arrows indicating these forces as being directed against a single distal incline of an upper molar tooth and a single mesial incline of its lower opponent.

Wedge Contacts Forceful: Overlooked entirely are the two remaining mesial inclines of the upper and the two opposing distal inclines of the lower.⁶ These, being wedge contacts, are much more forceful than the sin-

⁵McCollum, Beverly B.: Oral Diagnostic Procedure, Dental Items Interest 66:731 (August) 1944.

gle butt contacts pictured and criticized by the believer in cusplless teeth.

Cause of Forward Tipping of Lower Molars: These wedging contacts predominate two to one and being more effective mechanically, forces against these surfaces constitute one of the reasons why a lower molar is tipped forward when the adjacent anterior tooth has been lost and not replaced. If forces were against a single mesial lower and distal upper surface only, the tooth would be tipped backward, something that never occurs.

Similar Fallacy Exposed—Drawings of supposed forces exerted buccolingually expose the same fallacy; only the internal cuspal inclines are considered. The external surfaces buccally on the lowers and palatally on the uppers are omitted. When all four surfaces above and below are included it develops that functional forces buccolingually are equal in both directions by reciprocation. This means that there are no lateral forces at all being exerted on the alveolar bone by cusp teeth when articulated functionally.

Closed Bite Causes Protrusion—Cusplless teeth and centric relation are both responsible for forcing the jaw into protrusion although the effect of

the former is gradual while that of the latter is instantaneous. The excessive jaw power required to mash blunt occlusals through tough foods acts to resorb edentulous ridges, especially the lower ridges. This resorption closes the bite which in turn causes a protrusion. This is acknowledged by the proponents of cusplless teeth; in fact, they regard it as another argument for nonanatomic occlusals.

Contradictory Theories—The argument states that because there are no cusps to interfere, flat teeth set to correct "centric relation" will automatically adjust for both vertical and protrusive changes. The fallacy in this theory can be demonstrated by shaving two or three millimeters from the surfaces of occlusion rims that have been mounted to a centric relation vertical in any articulator. It is unnecessary to illustrate the consequences of this for an unalterable rule of conventional articulation procedure is that a centric relation vertical must never be changed in the articulator. How can a centric relation vertical, therefore, be changed in the mouth without maloccluding the teeth whether they be cusplless or not? One theory or the other must be wrong.

Detrimental Results of Jaw Protrusion

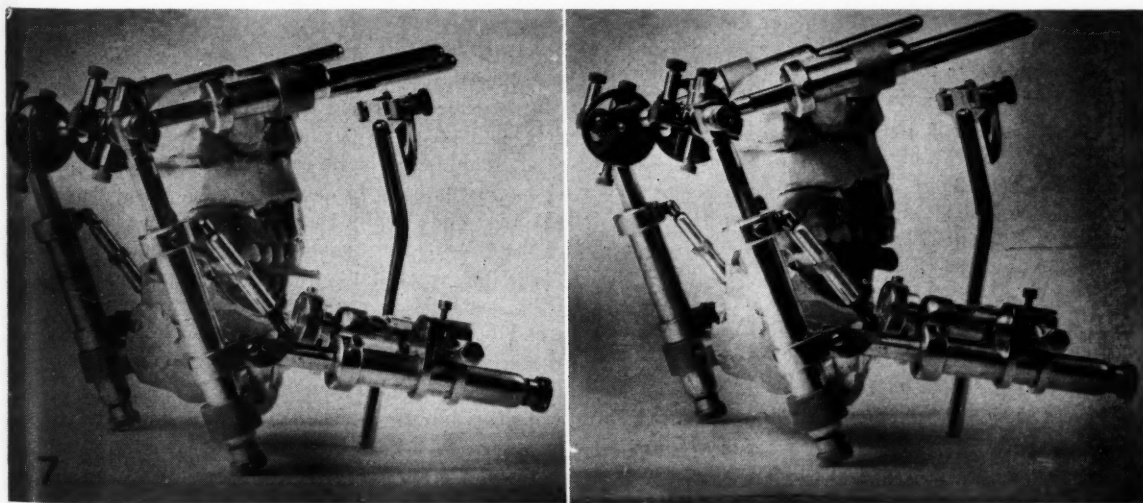
A patient who finds that he must

function in protrusion if he is to function at all shortly becomes habituated to this malfunction. Muscles accommodate until they have established jaw movement patterns that conform. The temporomandibular ligament (the anchor of condyle position in function) finding only part of its length in use, tends to shorten. Eventually, the patient may acquire a completely artificial condylar position. By every test, this position will appear to be the one to which any new set of dentures must be constructed.

Changes Reverse—When new dentures are made properly, by methods that permit use of the musculature and ligamenture of the jaw in a normal manner, the jaw change begins to reverse. In time (sometimes as quick as in a few hours) the patient's jaw will have dropped back toward normal even to the extent of half a tooth. This retrusion is usually bilateral but may be unilateral. This procedure may be repeated once, twice, or even three times until the mandible regains its natural position. The only difference discernible in subsequent retrusions is that they usually recur on a diminishing scale and at lengthening intervals.

Cause of Patient Distress—It must not be inferred that this change in jaw relationships occurs in every case. The fact that only about three out of ten patients display this disturbing

⁹Cohn, Louis A.: Occluso-rehabilitation and the Periodontal Problem. Chapter in Clinical Periodontology. by Glickman. Philadelphia, W. B. Saunders Company, 1953, p. 947, Fig. 720.



7. Note the symmetrical positions of the slides in the sliders in both figures shown here. Note that these relative positions have not changed in the slightest when the tapered screws were replaced.

anomaly serves to confuse prognosis. Change in jaw relationships is annoying to the patient; to a layman there appears to be no reason for his discomfort and for this readjustment of his teeth. It is especially disturbing when he knows that others have encountered no such difficulties.

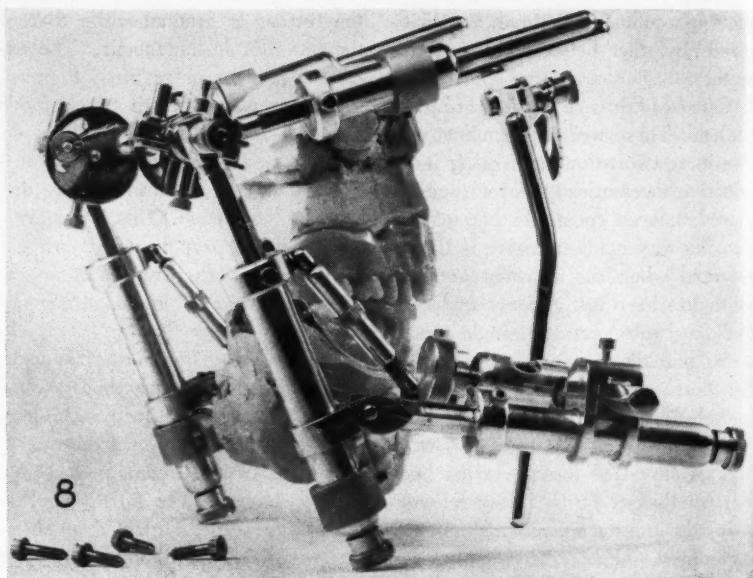
Basic Problem—The patient's distress is not the most serious feature in the situation, however. The real difficulty is that too few dentists are aware that an abnormal occlusion over extended periods can result in a temporary abnormal jaw fixation and that changes must be followed as they take place by a corresponding rearticulation or the teeth will be almost or totally unusable. The dentist using conventional articulation tends to blame his current "technique" and to begin making changes or searching for another method. In this way the problem is perpetuated.

Method of Determining Degree of Retrusion

In order to prove temporary protrusion Transographs have been kept unchanged from the original mounting upon which the teeth were articulated. Before the cases left the office, every wax bite from two to ten or more millimeters in thickness was proved acceptable to the transograph micrometrically. For a short time the teeth with cusps 45° and steeper functioned perfectly without the slightest discomfort. Then, suddenly, they became nonfunctional and uncomfortable. New bites were taken in the patient's mouth and when transferred to the original mounting they revealed that a gross retrusion had taken place. How this is determined is shown in Figures 5, 6, 7, and 8.

Figure 5—One of several original bites of varying thicknesses being accepted perfectly by the Transograph is shown. This particular bite was made in a thickness of wax that forced an occlusal separation of about 10 millimeters as indicated by the distance the cam follower (center rod in the upper frame of the instrument) is raised above the jaw movement guide stop bar.

Figure 6—The Transograph is



8. The mounting of a bite taken after the jaw position had changed is shown. All other bites of varying thickness produced exactly the same result.

shown accepting a bite with about 3 millimeters of occlusal separation. Note that in both figures the four end-tapered screws have been removed completely from the bosses atop the condyle sliders. Removal (actually, partly releasing is enough) of these tapered screws makes a universal joint of the Transograph. If there should be any discrepancy between the patient's jaw relationships and the articulator relationships, the condyle plates or slides will move in their sliders until the occlusals have accommodated themselves to the wax bite.

Figure 7—Note the symmetrical positions of the slides in the sliders in both figures. Then note that these relative positions have not changed in the slightest when the tapered screws were replaced. The tapered ends of these screws fit into V-shaped seats in the slide plates. Unless the screw points bottom perfectly, contact between the screw point and the slanting wall of the V-shaped seat will cause the slide to move. Errors as minute as one-fiftieth of a millimeter in any direction are detected easily.

Figure 8—The mounting of a bite taken after the jaw position had changed is shown. All other bites of varying thicknesses produced exactly

the same result. The positions of the condyle slides in their sliders reveal what has happened: since the condyle slides in the Transograph are attached where they belong naturally; namely, on the mandibular frame of the instrument, the retrusion of the slide plates in their sliders shows that the lower jaw has assumed a *retruded* position with respect to the original jaw position.

Correction of Retruded Position—A complete resetting of the upper or the lower working teeth, or both, to a new mounting will be necessary. Occasionally, especially if it be the second or third recurrence, the change may be found to be so minor that the teeth can be rearticulated by grinding to natural jaw functional movements in the instrument after remounting. Should subsequent changes occur, they must be treated again in the same way.

Important Factors in Treatment

The return of the jaw relationships from abnormal protrusion to normal with all the extra attention it entails occurs in natural tooth correction too, and especially in full mouth reconstruction where pathologic occlusion

has been long standing. By the use of temporary occlusals, it has been possible to observe and correct for the patient's return to normal jaw relationships. When ample elapsed time has produced no recurrence of jaw change functionally articulated crowns and/or other restorations have been made and installed permanently. Tests at intervals thereafter have shown that no further changes had taken place and that the patient was enjoying comfortable and efficient functional articulation.

Comment—It should be noted that nothing stated here regarding treatment of dentulous or edentulous cases is intended to apply conclusively to the so-called "sick joint" or temporomandibular joint situations. These are often in a treatment category of their own.

Corrective Treatment Prolonged—Malarticulation in natural or artificial teeth must be suspected as indicating a possible temporary jaw malposition requiring prolonged treatment with corrective operations. It is not something that may be dismissed as finished and cured by a single insertion of dentures, crowns, or bridges, no matter how perfect the technique.

Dentures may Become Destructive—In prosthodontia especially, it must be recognized that a set of teeth made to the patient's jaw relationships as presented may not only become unsatisfactory to the patient in a short time but also may actually become destructive. The latter danger applied with equal and sometimes more force to the patient who expresses himself as completely satisfied. Tests made on the articulation of these patients have frequently shown that they are of the adaptable type that fails to detect or else ignores symptoms of jaw changes that are preparing them for the time when they will report, "My teeth haven't been so good for the last year or so." By that time their mouths may look like purple hamburger.

Problem of Time Involved—This approach may be considered too time consuming, and so expensive that it

renders fee quoting too hazardous or even impossible. Such objections are no compliment to dentistry as a healing profession. Nor are they compatible with the accepted concept that the mouth is a functioning unit indispensable to digestion and must be treated as such, not as a cavity holding twenty-eight or thirty-two isolated teeth.

Problem of Fee Simplified—If endorsement of this unitary concept is honest the fee problem should be simplified rather than complicated by the impossibility of predicting the exact amount of treatment required. Patients are accustomed to indefiniteness concerning costs in other health services. The parallel will be obvious and readily accepted by the dental patient if the dentist himself understands, explains beforehand, and knows what to do afterward.

Hinge-Axis and Changes in Jaw Position

Some advocates of the hinge-axis concept have expressed the belief that the hinge-axis is a life-time constant. Beverly B. McCollum⁷, however, an authority on this subject has stated conservatively: "While I have never definitely said so and am not prepared to make a positive statement at this time, we have much evidence to show that the hinge-axis remains constant to the tattoo dot on the face throughout life, from childhood to old age." With commendable caution, he added, "Only time can answer the question positively . . ."

Temporary Changes in Hinge-axes—It is now fairly well established that hinge-axes do change temporarily when forced to do so by prolonged abnormal articulation. Whether they change where more normal conditions prevail and where the articulation is good is still not settled definitely. From admittedly untubulated and unanalyzed observations on hundreds of reasonably normal cases both dentu-

lous and edentulous, it would appear that constancy is the rule.

Personal Corroboration—In the writer's own mouth where almost perfect articulation of natural teeth has prevailed since childhood, hinge-axes tattooed in 1945 still prove themselves accurate and unchanged. This observation is offered for what it may be worth.

Summary

Centric relation and unnatural tooth forms have been discussed as creators of temporary protrusive fixation in many jaws. Resetting of artificial teeth and temporary occlusal capping in occluso-rehabilitation cases will be necessary with each change as these jaws are treated and returned to normal. To help prevent this problem from arising it will be necessary to abandon centric relation and cusplless teeth in favor of articulation based upon functional jaw movements and natural tooth forms.

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⁷McCollum, Beverly B.: Fundamentals Involved in Prescribing Restorative Dental Remedies, Dental Items Interest, Reprint from June 1939 to Feb. 1940, p. 17.

Modification of the ACRYLIC CROWN

ALAN SIMONSON, A.B., D.D.S., Savannah, Georgia

DIGEST

This article describes a quick and inexpensive procedure for restoring anterior teeth. The procedure fulfills satisfactorily the important esthetic requirements of the patient.

General Requirements

The successful restoration of an anterior tooth should have the following qualities:

1. It should be as esthetic an acrylic crown as possible.
2. Malalignment should be corrected to some degree.
3. The crown should protect the tooth satisfactorily should future treatment require a porcelain jacket or endodontic procedure.
4. An accurate shoulder adaptation should be provided.
5. The restoration should not be injurious to the pulp and gingivae.

Materials Required—The following materials will be used:

1. Acrylic facing of the desired mold and shade
2. Self-curing acrylic liquid and powder of corresponding shade
3. Alginate impression material and tray
4. Utility wax
5. Sticky wax

Choice of Cementing Agent—This will depend upon the purpose for which the jacket is to be employed. If it is to be used as a permanent restoration zinc oxyphosphate cement is preferred. If it is to be used only as a temporary restoration, zinc oxide and eugenol is satisfactory. The inside of the jacket should be lined with a thin

coating of dental varnish or cavity liner to prevent the softening action by the eugenol.

Procedural Steps

While waiting for the anesthetic agent to become effective the proper shade and tooth form may be selected. The following steps are then taken:

1. Grind the ridge lap and lingual portion of the acrylic tooth, leaving a thin acrylic facing (Fig. 1). If the alignment of the tooth is to be restored and the preparation of the tooth permits, leave the facing thick enough to prevent light from passing through. This will ensure a true shade. If the facing must be extremely thin, experience will aid in selecting a suitable cementing material when the crown is finally placed on the prepared tooth. Bevel the mesial, lingual, and distal extremities of the facing and, if the thickness permits, undercut these surfaces with a Number 35 bur. This will provide a mechanical as well as a chemical union between the facing and the rest of the crown (Figs. 1 and 2).

2. In preparing the tooth a complete shoulder should be incorporated which will surround the tooth lingually as well as labially. This shoulder should be carried subgingivally 1 millimeter beneath the free margin of the gingiva.

3. The facing is now placed in position on the prepared tooth and held in place by two small tacks of sticky wax on the labial surface adjacent to the teeth mesially and distally (Fig. 4).

4. The mesial, lingual, and distal

portions of the tooth are rebuilt to contour with utility or carding wax. The patient's bite is checked at this time to avoid grinding into occlusion later. Check the gingival margin and contour of the crown (Fig. 3).

5. Using a thin mix of alginate impression material, take an impression of the fully contoured tooth. Remove the alginate impression and dry it thoroughly. The facing should be attached to the adjacent teeth, but if it is removed in the impression no harm has been done. Remove the facing. Dry and clean it.

6. Mix a matching shade of self-curing acrylic and allow some preliminary polymerization to take place. In approximately two minutes the acrylic loses its stickiness and has the consistency of putty. Place the prepared acrylic facing in the impression

1. Preparation. (A) Original tooth outline (broken line). (B) Prepared tooth. (C) Shoulder beneath free margin of gingiva.

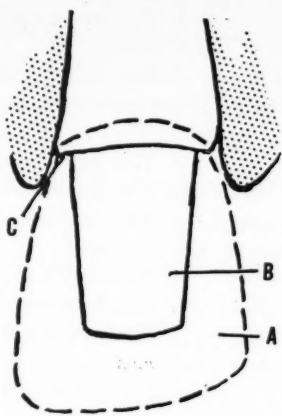
2. Acrylic facing. (A) Original tooth outline (broken line). (B) Prepared acrylic facing. (C) Undercut incisal edge.

3. Placing the facing in position. (A) Acrylic facing in position on the tooth. (B) Prepared tooth. (C) Shoulder beneath the free margin of the gingiva. (D) Utility wax completing the outline of tooth on the lingual, along the shoulder mesially and distally (stippled).

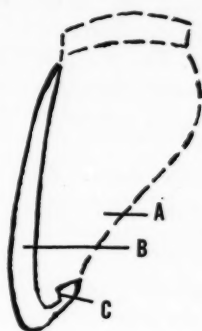
4. Acrylic facing held in position by "two tacks of sticky wax."

5. Alginate impression. (A) Acrylic facing replaced in socket. (B) Soft acrylic contoured to lingual, mesial, and distal of the socket and on the inside of the facing.

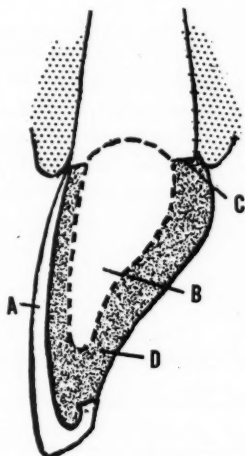
6. Polished acrylic jacket. Any correction of marginal fit can be made by painting soft acrylic (self-curing) on the marginal edge at (A).



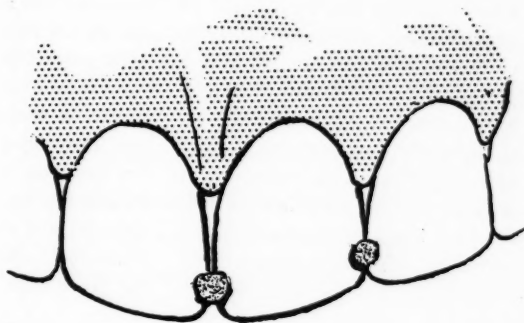
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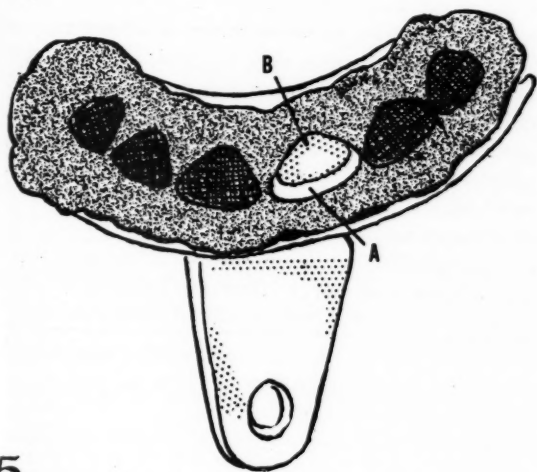
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5



6

and moisten the inner surface of the facing with the acrylic liquid. Place the acrylic from the jar in the impression, but avoid filling the entire socket. Mold the acrylic lingually, mesially, and distally. The prepared tooth should be lubricated with cocoa butter before replacing the impression in the mouth (Fig. 5).

7. Replace the impression and hold under pressure about 2 minutes and remove. If the acrylic drags and is sticky, replace the impression for another minute. Experience will be an aid in estimating the proper work-

ing consistency and time factor of the acrylic of choice.

Final Steps

1. Remove the jacket from the impression and finish with sandpaper discs. Polish with pumice and acrylic polishing agents.

2. Return the jacket to the prepared tooth for additional inspection.

3. Any discrepancies at the shoulder can be accurately corrected by painting a little acrylic liquid and powder on the deficient areas and replacing the jacket on the preparation (Fig. 6).

Advantages of the Technique

1. The crown can be prepared in one visit.
2. The color and mold of the facing are chosen by the patient and dentist and are not altered.
3. The facing affords the hardest type of processed acrylic.
4. Accuracy of shoulder adaptation is assured.
5. Fabrication is rapid.
6. The procedure is inexpensive.
7. The use of a die or laboratory assistance is unnecessary.

102 B Nelson Apartments

A Newer Concept of Disease—Curative vs. Creative Medicine

JONATHAN FORMAN, B.A., M.D., Columbus, Ohio

THE GREAT killers of man after middle life are not the changes of senility. They are usually due to dietary deficiencies running over a period of years. Most of us have a wrong concept, that what has been traditionally accepted as normal aging is, after all, the sum total, at least in part, of accumulated deficiencies. Many of them can be reversed by improving nutrition. As Pollock has pointed out, the con-

cept of an optimal nutrition and its long-time and late influence on old age, as well as upon the second and third generation, must be kept in mind if we are to understand properly the nutritional problem of old age. The major emphasis in creative medicine should be on a good balanced menu day by day, not on vitamins and mineral supplements. While the researchers are filling in the great gaps in our knowledge,

we know enough already so people could add at least ten years to their lives on the average if they would follow the proper principles.

Of the favorable factors in man's environment, the most important is nutrition—most important because each of us can do something about it.

From *Mississippi Valley Medical Journal* 77:45 (January) 1955.

The Relation of Adequate Nutrition to Atherosclerosis

F. A. KUMMEROW, Ph.D., Urbana, Illinois

Adequate Diet

It is apparent that either an inadequate diet or an unbalanced hormone therapy has always been necessary to induce experimental atherosclerosis. Therefore it cannot be overemphasized that a balanced diet adequate in fats, protein, minerals, and vitamins may serve as the best insurance against atherosclerosis. Such a diet will

contain cholesterol and animal fats because eggs, milk and meat products serve as the best sources of these essential nutrients. If consumed in moderation and with vegetables as a source of plant sterols to partly complex or tie up the dietary cholesterol, such a diet would be more apt to insure maximum lipoprotein, phospholipid and cholesterol ester synthesis than

one deficient in protein and high in carbohydrate. The latter type of diet may lower food cholesterol levels but does not give any assurance that the excess cholesterol has been metabolized and not added to the existing deposits already on the arterial wall.

From *Food and Nutrition News* 27:4 (October) 1955.

The EDITOR'S Page

THE HANDS of the dentist are among his prized assets. His hands must have skill to perform the work that is required. They must also be pleasing to the eyes of patients: clean, well-cared for, without evidence of disease. There are occupational hazards that endanger the hands of the dentist, chiefly from the instruments and drugs that he is required to use.

Despite the sharp instruments that the dentist uses he receives relatively few serious cuts or puncture wounds. His greatest danger is from the occupational dermatitides that come from repeated hand-washings and from the use of chemicals.

A British physician writes on the subject of occupational dermatitis among dentists:¹

"In the healing professions, all are exposed to some extent to the effects of repeated washing, particularly surgeons, dentists, obstetricians, midwives and nurses. Repeated degreasing of the skin is followed by chapping in cold weather, when the secretion of the cutaneous glands is minimal. Chapping, or any other break in the epidermis, is the common precursor of dermatitis, by allowing entry of organisms or of irritants or sensitizing substances to the more vulnerable prickle cells and even to the dermis. Organisms may then cause infective dermatitis, folliculitis, boils or cellulitis; irritant substances may cause a localized primary irritant dermatitis; and sensitizers may cause a more widespread eczematous dermatitis; or these effects may be combined . . . But dentists are exposed to the greatest variety of potentially sensitizing substances, including anesthetics, antibiotics, antiseptics and resins, and for this reason are especially prone to occupational dermatitis."

We seem to hear less in recent years about so-called novocaine dermatitis that afflicts the fingers of dentists. Improved anesthetic solutions, better

vials, and improved techniques have reduced the incidence of this annoying condition. Russell suggests that the contact dermatitis from local anesthetic solutions is of an allergic origin and that the primary exposure may have come from the use of a local anesthetic cream or lotion on the treatment of a pruritic skin condition. Following the professional use of local anesthetic solution, sensitization may develop with redness and scaling of the skin of the fingers that came in contact with the solution.

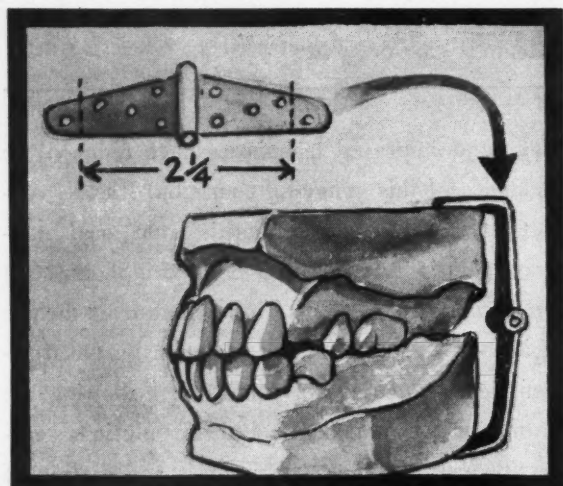
Almost any dentist could compile a list of substances that he uses that are potential skin irritants. A dental colleague of Russell's listed 41 drugs or chemicals used in the dental department of a large general hospital. Among this number seven were considered harmless to the skin; 17 were primary skin irritants (caustic acids and alkalies, silver nitrate, fat solvents and soaps, and an oxidizer); another 17 were potential skin sensitizers (cresols and phenols, iodine, mercurials, penicillin, and local anesthetics, particularly benzocaine and its derivatives).

The after-office hours care of a dentist's hands is important. Perhaps more serious injuries befall the hands of a dentist in his avocational pursuits than during his working time. Hammer-saw injuries, automobile accidents both on the road and during do-it-yourself tinkering, hunting and fishing mishaps, broken fingers from baseballs are among the common recreational traumas.

The dentist who is meticulously careful of his hands during office hours should carry this same kind of attention into his sports, pastimes, and hobbies. The dentist should never forget that injury or disease of the hands may make it difficult to carry on the work for which he has been long and expensively trained.

¹Russell, Brian: Occupational Dermatitis in Dentists, British D.J. 98, No. 10:348 (May 17) 1955.

1



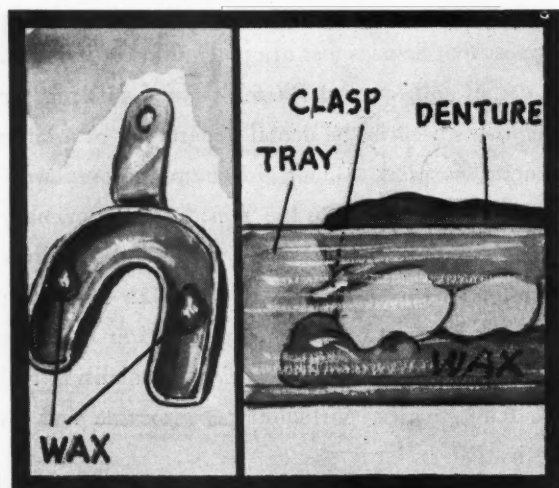
Clinical and Laboratory

A Hinge to Articulate Study Models

William L. Peacock, D.D.S., Hartsdale, New York

1. Bend the ends of an ordinary brass hinge at right angles with $2\frac{1}{4}$ inches between the bends. This affords a simple and inexpensive method to make a permanent mounting of study models.

2

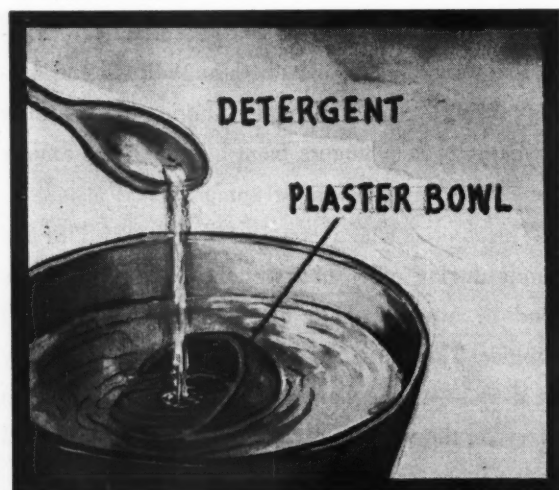


Impression for the Repair of a Broken Clasp

Con J. Fecher, Jr., D.D.S., Dayton, Ohio

2. Place small balls of wax in the impression tray. When the impression for the clasp repair is taken the balls of wax should touch the occlusal surfaces of the denture teeth. This procedure will ensure that the partial denture is properly seated on all tooth and tissue-bearing areas.

3



Alginate Impression Solvent

William R. Adams, D.D.S., Springfield, Massachusetts

3. A plaster bowl in which alginate has been mixed may be cleaned by immersing it in a pan of warm water to which a couple of spoonfuls of detergent have been added. The same method may be used to clean trays.

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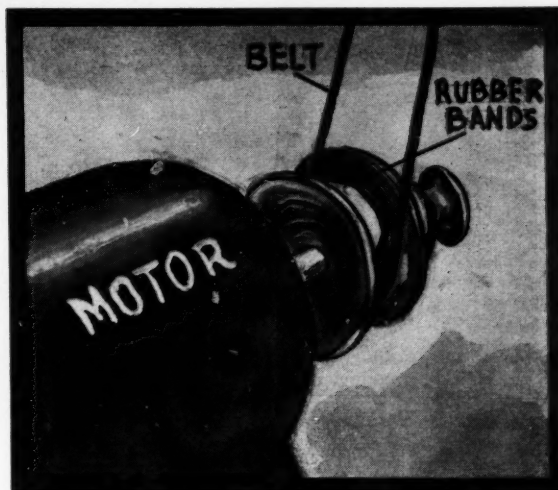
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Reduction of Engine Belt Slippage

Herbert E. Rashkind, D.D.S., Long Island City, New York

4. Two or three orthodontic rubber bands slipped into the grooves of the engine pulley will provide enough traction to prevent the engine belt from slipping.

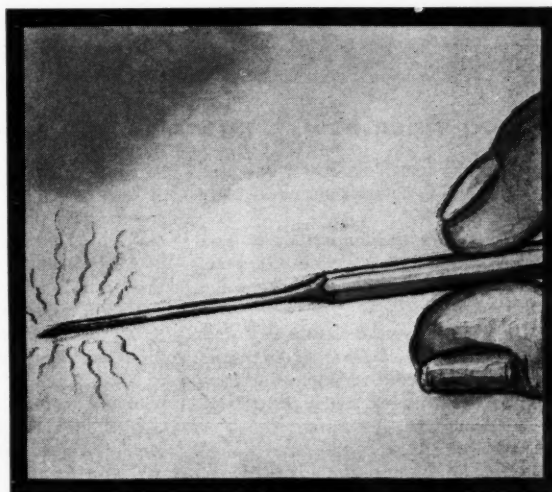


4

Hole Punch for Rubber Dam

Charles Q. Orden, D.D.S., Manhasset, Long Island, New York

5. Heat a tapered pointed instrument in the Bunsen flame. Pierce the rubber dam. The hole produced can vary in size depending on the depth to which the tapered instrument is inserted. The searing heat will produce a clean hole and one with a bead around the periphery.

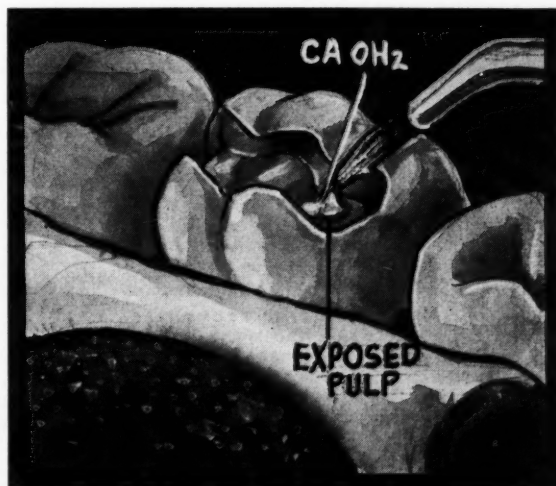


5

Placing Calcium Hydroxide on a Pulp Exposure

Harvey A. Sherman, D.D.S., Dayton, Ohio

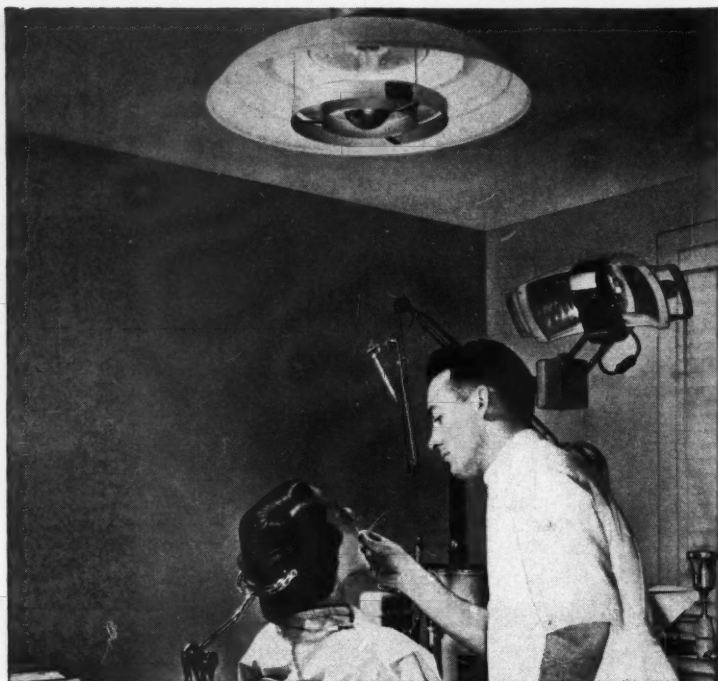
6. Mix calcium hydroxide with distilled water. Pick up the mixture with a contra-angle camel's hair brush and place lightly over the exposed pulp.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 36 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.



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MEDICINE

and the

Biologic

Sciences



Epilepsy

The tendency to idiopathic epilepsy is transmitted through heredity, and like (1) cancer, (2) diabetes, (3) hemophilia, and (4) muscular dystrophy, the disease in advanced stages is incurable. Even though epilepsy may be controlled medically, the tendency is still transmitted to progeny.

Expression of the tendency may be not only as the classical epileptic seizure but also as (1) febrile or anesthetic convulsions, (2) eclampsia, and (3) seizures caused by minor brain trauma.

The electroencephalogram is of great value when employed for (1) confirming the diagnosis of epilepsy and distinguishing the various types, (2) determining the carrier in parents and relatives and the potential in siblings, and (3) aiding evaluation of results of treatment. A number of electroencephalograms may be necessary to obtain a satisfactory tracing. The interpretation must be guarded and sound.

(Continued on page 34)

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Complete control of convulsions is the objective of therapy. A reduction of seizures which does not allow normal activity and freedom from supervision is of limited value. The ketogenic diet is the most effective treatment for all forms of idiopathic epilepsy and for correction of the basic disorder. A preliminary fast, however, of ten to fourteen days and rigid supervision of food intake are required.

Phenobarbital is the most effective, reliable and non-toxic medication for grand mal and major convulsions. It has no effect on petit mal seizures and may aggravate behavior disorders in patients with psychomotor epilepsy or chronic encephalitis.

There are several other drugs which may be effective in selected cases. The drug chosen should be given in increasing doses to effectiveness every six or eight hours or in enteric coated capsules every twelve hours. If the medication is not completely effective in one month another should be substituted.

Once seizures are controlled the

drug should be continued for at least one year and, if possible, until the electroencephalogram is normal. Dosage is then gradually reduced for another year or two. In no case should a drug be discontinued abruptly even if another is to be substituted.

Peterman, M.G.: The Present Status of Idiopathic Epilepsy, J. Pediat. 44:624-629 (June) 1954.



Burning Tongue

There are many patients around the age of 50 who complain bitterly about burning of the tongue or cheek. Some complain about a metallic or unpleasant taste in the mouth. Many of these persons seek medical advice and have taken all sorts of vitamins and medicines without the least benefit. Some have even had the mucous membrane thoroughly anesthetized with procaine without any result. Such a reaction

should suggest that the cause is not in the tongue or cheek but in the nerves or in the brain.

In the great majority of these persons it is impossible to detect a visible lesion that would account for the disturbance. No benefit is obtained even after the patient has been thoroughly injected with vitamins.

It has been noted that some of these patients had begun to have their disturbances the day they had a little stroke or a big one. Some authorities believe, therefore, that in almost every case the most probable cause of the disturbance is the plugging up of a small artery in one of the centers to which sensory fibers go from the tongue and cheek.

The fact that the burning is in only half of the tongue or one cheek supports this contention. Also, these people are always past middle age. Typical of distress due to a little stroke is the fact that the burning remains unchanged for years. No sedative or any drug alters the sensation. No evidence appears locally. To date there is no

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CLINICAL AND LABORATORY SUGGESTIONS

(See pages 30 and 31)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor

DENTAL DIGEST
708 Church Street
Evanston, Illinois

From: _____

Subject: _____

Explanation of Procedure: _____

Sketch: _____

Suggestions submitted cannot be acknowledged or returned.
\$10 will be paid on publication for each suggestion that is used.

known procedure or medication that will help these people.

Editorial: Modern Medicine 22:63
(August 15) 1954.



Spontaneous Hemorrhage

Episodes of spontaneous bleeding occur in many parts of the body. The nose, however, is the most frequently involved.

Bleeding for which no underlying etiology can be demonstrated must be classified as spontaneous although the term is unsatisfactory. Even after a thorough study of blood coagulation, the mechanism of many hemorrhages is obscure.

Many of the causative factors of spontaneous bleeding may be estrogen withdrawal. Lack of estrogen results in formation of a vascular toxin and dilatation and damage to blood vessels produce hemorrhage. Successful treatment of spontaneous hemorrhage with estrogens tends to support the thesis that the bleeding may be one manifestation of generalized hormone involvement.

The cause and the source of the bleeding must be differentiated sharply. Cerebral aneurysms, peptic ulcers, and esophageal and vesical varices may be sources of hemorrhage, but the reason for bleeding is usually not apparent.

There are several typical features associated with the syndrome of spontaneous bleeding from the nose: (1) The volume of blood loss is out of proportion to the size of the vessels at the site of the bleeding. (2) The pulse is rapid and forceful but returns to normal when the bleeding stops, even without blood replacement. (3) Agitation and apprehension are prominent and sedation and reassurance are important in therapy.

Estrogen is not recommended as the treatment for all nosebleeds. A trial of estrogen as early therapy, however, should be considered. The toxic manifestations of the drug are minor and even if a specific cause for the bleeding is discovered, estrogen will do no harm.

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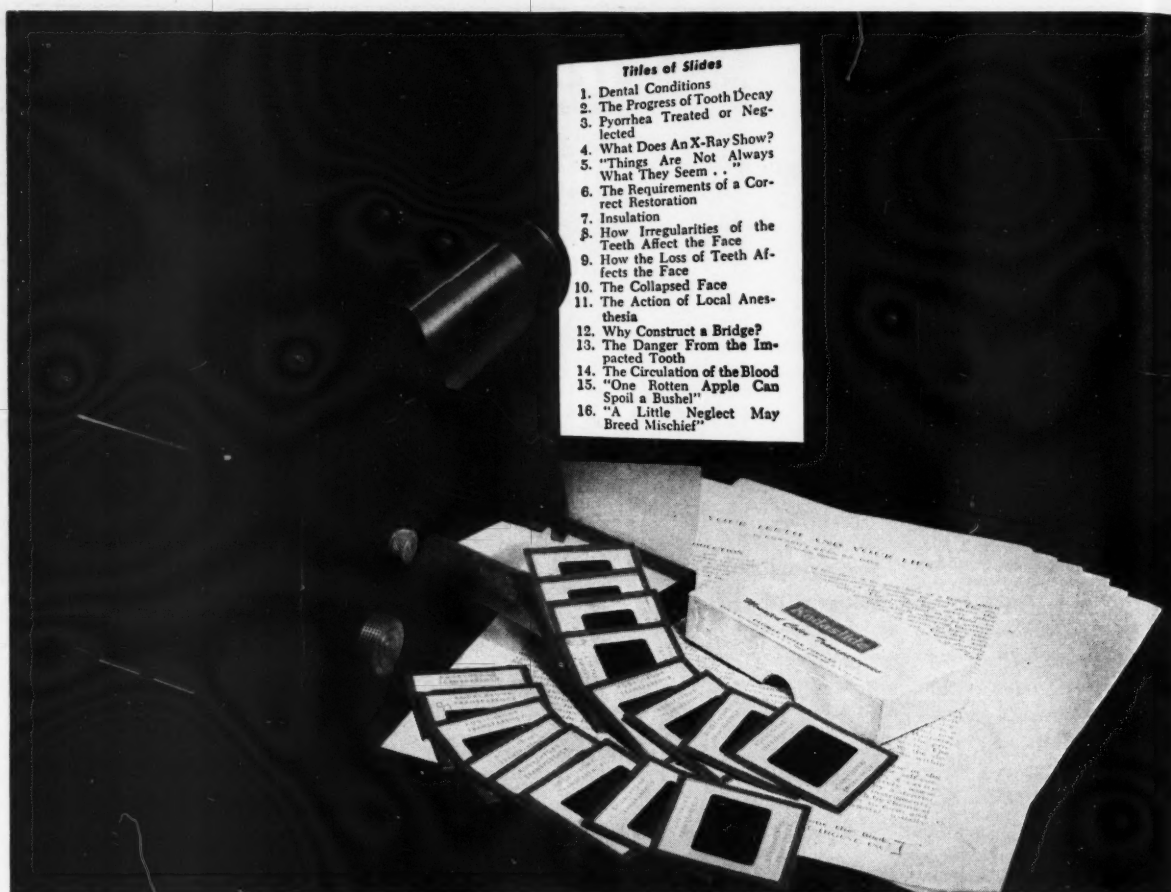
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10. The Collapsed Face
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Extensive local measures such as cautery and packing may be ineffective for epistaxis. Blood transfusions can often be avoided and should be administered cautiously if at all.

Jacobson, Philip: Spontaneous Hemorrhage, Archives of Otolaryngology 59:523-530 (May) 1954.



Surgery for Diabetics

Certain procedures are necessary when the diabetic patient is to undergo surgery. It is wise for the dentist to keep some of these things in mind when performing oral surgery for these persons.

Careful preoperative preparation is essential. Close supervision of insulin dosage is necessary. If the surgery is elective, preparation with a high-protein and carbohydrate intake augmented with vitamins to replenish liver glycogen, tissue and serum proteins may be valuable. Fluid and electrolyte losses should be corrected.

Also the cardiovascular status of these patients should be thoroughly evaluated. For cardiac diabetic patients, parenteral fluids and feedings when needed are administered at a slow rate as concentrated solutions of dextrose or fructose. Slight hyperglycemia is advisable in known cardiac cases. A fasting blood sugar level between 150 and 180 milligrams is advisable before and after operation. High levels of blood sugar should be gradually reduced. Sustained hyperglycemia above 200 milligrams should not be permitted because of predisposition to infection, poor wound healing, body protein loss and ketosis.

Insulin and fluid requirements must be tailored to meet the individual needs. Depot insulin is administered subcutaneously on the day of opera-

tion at the time when parenteral feedings are started to replace meals and is given in dosage equal to preoperative amounts. The operation should preferably be in the morning, the first infusion replacing breakfast carbohydrate. Individuals scheduled for afternoon surgery may be given a liquid breakfast and subsequent parenteral feedings.

The intravenous feedings replace only the carbohydrate portion of the diet, omitting the estimated available carbohydrate from fat and protein. The volume and concentration of fluid

depend on (1) the patient's fluid requirements, (2) tolerance based on age and cardiovascular status, and (3) caloric requirements.

Increased caloric intake and replacement of electrolytes are needed if parenteral feedings are required longer than forty-eight hours. Supplements of regular insulin may be needed post-operatively.

The patient with acidosis who requires emergency surgery should be treated vigorously with regular insulin, fluids, electrolytes, and antibiotics. Operation should be delayed sev-



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Fig. 1



Fig. 2



Fig. 3

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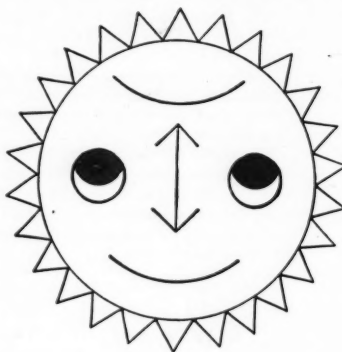
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eral hours if possible to institute diabetic management.

Diabetes does not call for a particular anesthetic agent. Anesthesia to give rapid and successful conduct of the operation is the chief aim. Standard preoperative medications are used except in some cases of emergency operations on persons with ketosis and dehydration.

Shuman, Charles R.: Management of Diabetes Mellitus in Patients Undergoing Surgery, JAMA 155:621-626 (June 20) 1954.



**Air Travel and Heart
Disease**

Patients with heart disease often want to know if it is safe for them to travel by air. The old saying, "if you can walk, you may fly," still seems to hold true.

For every 100,000 passengers there are about six persons who experience attacks of unconsciousness. The causes for these attacks are (1) previous illness, (2) overfatigue, (3) emotional stress, (4) epilepsy, (5) cardiovascular disease, (6) pregnancy, and (7) unrevealed causes. The death rate and number of attacks of unconsciousness during flight are low. These incidents are fewer in pressurized than in nonpressurized aircraft.

The stresses of air travel include not only the flight itself but the following factors: (1) the trip to and from the airport, (2) climbing aboard, (3) the tension caused by delay in take-off, and (4) the possibilities of missing connecting plane or landing at an alternate airport in the event of unfavorable conditions. Factors listed under flight stress include (1) the number of stops, (2) the type of plane, (3) duration of the flight, and (4) the weather conditions. Specific stresses are (1) reduced atmospheric pressure, (2) acceleration, (3) noise, and (4) danger.

Reduction of atmospheric pressure may affect the body by producing anoxia, expanding free gases in the body and releasing gases which are in the blood. The civil air regulations

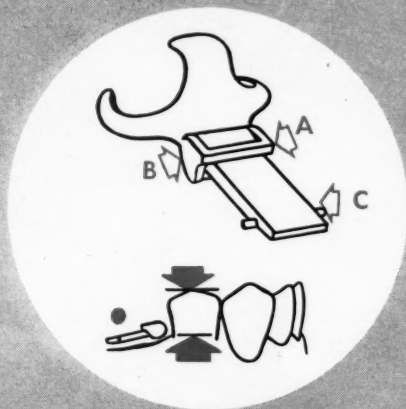
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the *D-E Hinge

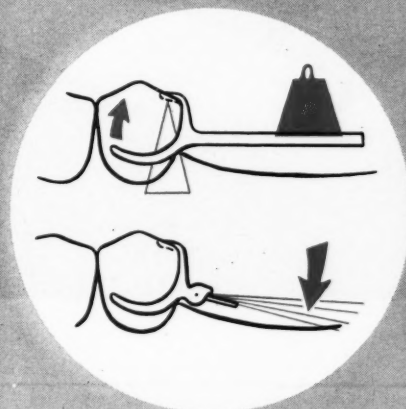
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- Adds a new feeling of comfort to Vitalium® free-end saddle cases.



Simple

The D-E Hinge is a tiny preformed precision unit that accomplishes a big job. A stop-bar (A) arrests dislodging movement. The trunnion design (B) prevents lateral movement while tailpiece design (C) permits use of the unit even when space is limited. The unit becomes an integral part of a one piece Vitalium casting and is completely concealed.



Effective

By relieving lateral stress on abutments and minimizing distal torque, the D-E Hinge prolongs the life of abutments. Saddles move against the ridge, stimulating the ridges and maintaining them in healthy condition. With the saddle reacting to chewing movements, there is no noticeable feeling of stress on abutments and the denture fits comfortably for a longer period of time.

Prescribe Vitalium partials and specify the D-E Hinge on free-end saddle cases, even for close-bite conditions.

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require supplemental oxygen on flights of more than 30 minutes above 8000 feet. Anoxia today is rarely a problem in airplane flight.

Free gases in the body expand and contract with changing pressure. Persons traveling by air sometimes develop abdominal distention or obstruction of the middle ear or sinus. Postponement of a trip may be warranted if a person has an upper respiratory infection. For the earache which is more likely in descent than in ascent frequent swallowing helps. People who frequently have abdominal distention should avoid eating gas-forming foods prior to travel.

Motion sickness is one important problem related to accelerative forces experienced during flight on commercial lines. Many preventive measures are now available. Motion sickness develops less frequently in good weather than in bad, at night compared with daytime and at high compared with low altitudes. Seats in the center are preferred to those at the ends of the cabin. One should keep the eyes closed and avoid moving the head. Drugs such as dramamine, bonamine or hyoscyne hybromide are helpful.

People flying the first time become apprehensive when speeding in an atmosphere with a dense overcast or rain-storm. They worry about seeing streaks of oil on the engine or wings. They fret about sparks from the exhaust. Reassurance by the crew on these points is helpful.

Editorial: Air Travel and Heart Disease, Postgrad. Med. 16:76-77 (July) 1954.



Focal Infection with Dermatosi

There appears to be a relationship between focal infection and tubercu- lids, syphilids, dermatophytids, and bacterids. It is also believed that there may be an association of focal infection with localized bullous and infectious eczematoid eruptions, angio- edema and chronic urticaria, ery- theme multiforme and nodosum and simple purpura.

It has been a matter of dispute that

microorganisms and nitrogenous prod- ucts from a chronic site of infection may produce distant secondary le- sions. Such a role is not easily proved but the concept is theoretically valid and cannot be discarded.

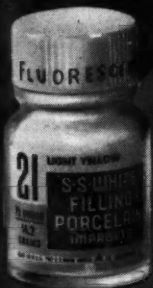
An etiologic relationship between a focal infection and a skin disturbance is proved when (1) the disease re- gresses after infection focus is re- moved, (2) the suspected focus har-

bors an organism that can produce a distant lesion, and (3) readministra- tion of the microorganisms or prod- ucts of the agent reproduce or precip- itates the lesion that was cured by re- moving the site of infection.

Conclusive proof is difficult to es- tablish. Diseases believed to be of fo- cal origin often are not eliminated when the primary site is destroyed. However, permanent tissue changes

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caused by the microbial products may preclude improvement.

Sometimes a focal infection cannot be demonstrated with an apparently secondary skin disease. Conversely, foci may exist among apparently healthy persons. The failure, however, of a focus to produce distant lesions shows that accessory or conditioning factors may be essential.

Chronic infectious foci may pro-

duce distant skin lesions by the following mechanisms: (1) Organisms discharged into the blood or lymph streams which may cause secondary infection by metastasis. (2) Tissues at a focus which may become sensitized to the nitrogenous products of bacterial metabolism and cause distant tissue reactions. (3) The reaction of some bacteria with host tissue which may produce antibodies against

the altered tissue components and cause inflammatory changes.

Though the focus is an infection, a secondary skin disease is rarely due to metastasis but usually results from an allergic reaction.

Nelson, Carl T.: Focal Infection and Diseases of the Skin, Postgrad. Med. 15:557-560 (June) 1954.

Contra- Angles



The Dentist as an Inventor

Every dentist that I know is an inventor at heart. Some have done well enough with their tinkering, so well that they have deserted the profession for the world of promotion and business. They are the exceptions. Most of the others have either barely made ends meet with their inventions or have lost money in their ventures.

For those dentists who are searching for something to invent I offer gratuitously, with generous heart, and without claim on royalties a few items for their consideration.

First off, I suggest a confection of some kind that will attract the appetites of our children away from candy bars, chewing gum, and soft drinks. Fabulous fortunes have been made by the people who turned out these sweet products. Now we should be ready for wealth to flow upon the one who invents something to substitute for these sweets.

A candy bar that teemed with vital food elements, was free from sugar, and that might even be reinforced with vitamins and minerals would never have a chance for commercial success if it was offered as a *health* food. Most people resent the health appeal in foods. This is likely some deep guilt feeling, but there it is. The candy bar for the inventor to work on would have to be offered in full blown competition with other confections. It

could not be marketed in a bleak package, with an abundance of scientific claims. It would have to taste good, look good, smell good—*Be good*. It could be the most devastating biologic concoction in the world but if it did not have popular appeal it would fail in the markets of commerce.

It would seem that in the field of soft drinks some clever inventor could come forth with something that was not filled with sugar or phosphoric acid. It should be strictly a nonalcoholic drink that was soft and pleasant but that still retained some of the merits from natural vitamins and minerals. Here again marketing would need follow the traditions of business rather than the claims of scientists.

Second on the list of suggestions to inventors is some game that a person can play alone. There are plenty of games for two or more people to play. There are thousands of lone people in the world, thousands of sick and invalids, who grow weary of the television and radio programs and who dislike or soon have their fill of reading.

The card game of solitaire is diversional and it also has an early boredom quotient. A few games are the most a person can play without developing a full-blown case of ennui. The inventor who works on a lone-hand game must make it simple, uncluttered, inexpensive. The person confined to bed cannot be burdened with complicated devices or those hard to handle.

The final suggestion for an invention touches a spot that is of interest to most dentists. It concerns a device of some kind that can satisfy the urge for hunting and fishing. Most dentists are devotees of both these sports, but many find it too difficult or too expensive to pursue these outdoor pleasures.

There can never be a substitute for live game on foot, on the wing, or on the end of a fish line. Trap and skeet shooting are fine tests of skill and the moving targets simulate game in flight—if your imagination is fertile. For the dentist who cannot afford to

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The unique anti-caries ingredient in CREST toothpaste is Fluoristan, a special fluoride compound. Fluoristan is the only fluoride compound known to be capable of bringing active, effective fluoride in contact with teeth through the medium of a toothpaste. This exclusive compound contains stannous fluoride, which is imparted to teeth during routine brushing. It combines with and strengthens tooth enamel, and has been shown to fortify it against decay acids.

CREST is the only toothpaste to present clinical evidence of significant decay reduction among children and adults after a full year of unsupervised home use. Therefore, CREST is recommended to you as by far the most promising of all dentifrices, worthy of a place in your caries prevention program.

Why we put Fluoristan in CREST, instead of just adding "fluoride"

Dental scientists at Indiana University began their search for a new fluoride compound when clinical studies revealed that sodium fluoride was ineffective in a toothpaste.¹ Hundreds of potential anti-caries agents were tested. Stannous fluoride was found to be greatly superior to sodium fluoride, and all other agents,^{2,3} for purposes of a toothpaste.

Conventional toothpaste ingredients inactivate fluoride. But with the aid of Procter & Gamble researchers, the scientists found a way to combine stannous fluoride with a new ingredient that maintains the activity and effectiveness of stannous fluoride in CREST. Result: *Fluoristan*.

BIBLIOGRAPHY

1. Bibby, B. G.: A Test of the Effect of Fluoride-Containing Dentifrices on Dental Caries. *J. Dent. Res.* 24:297-303 (1945).
2. Muhler, J. C., Boyd, T. M., and Van Huysen, G.: Effect of Fluorides and Other Compounds on the Solubility of Enamel, Dentin and Tricalcium Phosphate in Dilute Acids. *J. Dent. Res.* 29:182 (1950).
3. Ericsson, Y.: Reduction of the Solubility of Enamel Surfaces. *Acta odontol. scandinav.* 9:60 (1950).
4. Muhler, J. C., Radtke, A. W., Nebergall, W. H., and Day, H. G.: Effect of a Stannous Fluoride-Containing Dentifrice on Caries Reduction in Children II. *J.A.D.A.* 50:163 (1955).
5. Muhler, J. C., Radtke, A. W., Nebergall, W. H., and Day, H. G.: A Comparison Between the Anticariogenic Effects of Dentifrices Containing Stannous Fluoride and Sodium Fluoride. *J.A.D.A.* 51:556 (1955).
6. Muhler, J. C.: The Effect of a Stannous Fluoride-Containing Dentifrice on Dental Caries in Adults. Presented to the American Association of Public Health Dentists, November 7, 1954 (Accepted for publication by *J. Dent. Res.*).

belong to a hunting club or take long and expensive trips into game country, trap and skeet shooting represent a fair approximation to hunting. Even in these sports it should be possible for the inventor to come forth with something more like field conditions.

So far as I know, with the exception of the fancy tournament bait and fly casters, there has been nothing that imitates fishing. Despite the Izaak Walton League and other conservation and wildlife workers the lakes and streams of the country near

the larger cities do not afford productive fishing. In many states the department of natural resources has done noble work with fish hatcheries and in stocking waters. But the battle against pollution of the lakes and streams has been a losing one. In the remote inland areas and along the coastline good fishing may still be enjoyed.

The invention that is needed is something that can be used in park lagoons, in the streams and lakes near densely populated areas. It should

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Over 5,500 children and adults are included in nine independent clinical studies of CREST. All studies are conducted according to procedures suggested by leading dental scientists—no attempt is made to supervise or control the oral hygiene routines normally practiced by the subjects.

49.3% CARIES REDUCTION IN CHILDREN⁴

Summary of results published in the Feb., 1955 issue of THE JOURNAL of the AMERICAN DENTAL ASSOCIATION.

new Decayed, Missing or Filled surfaces per 100 children

0 50 100 150 200 250 300 350

CONTROL

CREST PREVENTED:
146 new DMF surfaces

42% CARIES REDUCTION IN ADULTS⁶

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0 50 100 150 200 250 300 350

CONTROL

CREST PREVENTED:
84 new DMF surfaces

Clinical study no. 1—423 children, aged 6-16

This study, conducted by the Indiana University School of Dentistry, shows significant caries reduction after one year. Summary of results is at left above.

Clinical study no. 2—750 grade school children

Compares CREST with a sodium fluoride dentifrice plus a control. After one year's results among CREST users confirm Study No. 1.⁵ The sodium fluoride dentifrice was not effective in reducing caries significantly, confirming other independent studies.

Clinical study no. 3—322 adults, aged 18-36

This test shows that the effectiveness of CREST is not restricted to children. Results appear at right above.

Six additional independent clinical studies are now in progress among over 4,000 new subjects. Summaries of the results of these studies will be made available to you soon after they are reported.



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give the angler sport that is a reasonable facsimile of actual fishing. To be sure, there is nothing exactly like the thrill of a bass or trout fighting at the end of a line or a muskellunge breaking water. No artificial device can take the place of the real thing any more than a paper rose can compare with the living flower.

In these times of electronic devices remote control rockets, and atomic power submarines it should be possible to invent some kind of underwater mechanism that acted like a fish and

that would take to bait of some kind. After contact was made between the artificial fish and the bait the device might release energies that would give performance of a live fish giving battle. The skill and sport would come from learning how to regulate and control the impulse that would bring the "fish" and bait together. Fantastic? Absurd? Holes in the cranium? Not at all when we consider the electronic devices now at hand, such as the automaton that solves mathematical problems more accurately

and faster than any human brain.

In our own little world of dentistry there are hundreds of problems that are waiting to be solved. Some of them are biologic, others are mechanical. There are enough to go around so every dentist who has the urgings of the inventor, has the opportunity to make some kind of contribution.

—E.J.R.

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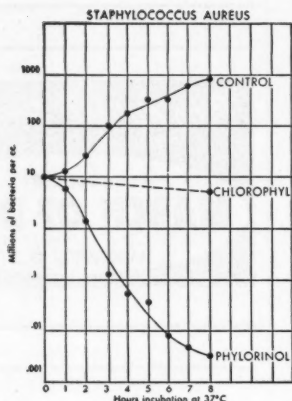
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